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OFFICIAL HANDBOOK
OF
SOUTH AFRICA.

A RÉSUMÉ
OF
THE HISTORY, CONDITIONS, POPULATIONS,
PRODUCTIONS, AND RESOURCES
OF THE SEVERAL
Colonies, States, and Territories.

EDITED BY
JOHN NOBLE.



HOOVER INSTITUTION
on War, Revolution, and Peace

FOUNDED BY HERBERT HOOVER, 1919

CASTLE LINE

ROYAL MAIL SERVICE.

WEEKLY



SAILINGS

FOR THE GOLD FIELDS OF SOUTH AFRICA.

LONDON, SOUTHAMPTON, MADEIRA,
GRAND CANARY, CAPE COLONY, NATAL, DELAGOA BAY,
BEIRA, MADAGASCAR, AND MAURITIUS.

FLEET:

Steamer.	Tons.	Steamer.	Tons.
NEW STEAMER (Building) ..	6,000	" LISMORE CASTLE "	4,045
NEW STEAMER (Building) ...	—	" PEMBROKE CASTLE "	3,878
NEW STEAMER (Building) ...	—	" DRUMMOND CASTLE "	3,663
" TANTALLON CASTLE "	5,636	" GARTH CASTLE "	3,660
" DUNOTTAR CASTLE "	5,465	" GRANTULLY CASTLE "	3,454
" ARUNDEL CASTLE "	4,588	" HARLECH CASTLE "	3,284
" ROSLIN CASTLE "	4,487	" WARWICK CASTLE "	3,056
" NORHAM CASTLE "	4,392	" METHVEN CASTLE "	2,605
" HAWARDEN CASTLE "	4,380	" VENICE "	511
" DOUNE CASTLE "	4,045		

THE ROYAL MAIL STEAMERS OF

THE CASTLE MAIL PACKETS COMPANY, LIMITED,

Leave London every alternate Friday, and sail from Southampton on the following day, with Mails, Passengers, and Cargo, for Cape Colony and Natal, calling at Madeira.

Intermediate Steamers are despatched every 14 days from London and Southampton, for Cape Colony, Natal, Delagoa Bay, &c., via Grand Canary, thus forming a weekly service from London and Southampton.

Passengers and Cargo are taken every fortnight for Delagoa Bay, every four weeks for Madagascar and Mauritius, and at stated intervals for Beira and St. Helena.

Through Bookings from the Continent.

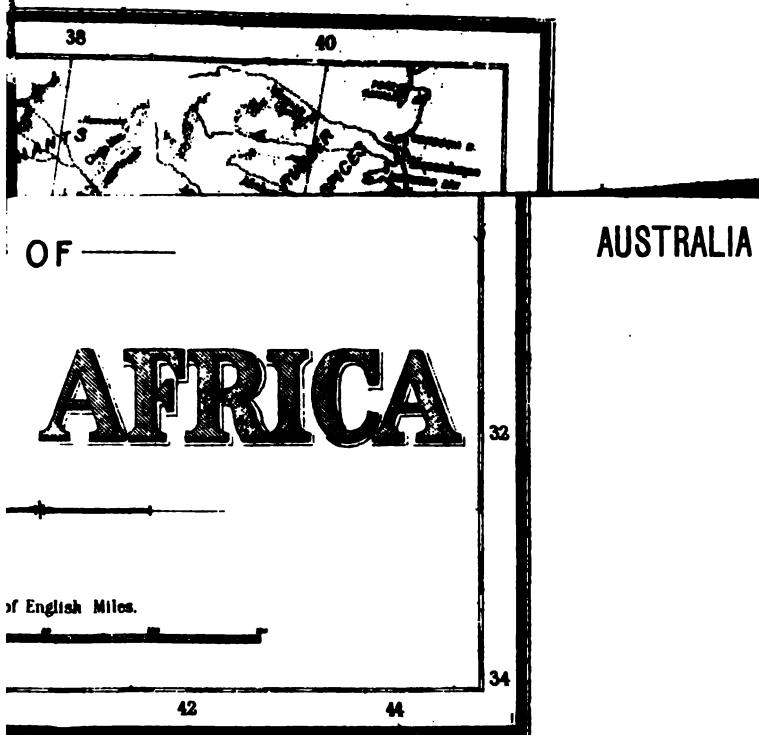
Return Tickets issued for ALL PORTS. Handbook of information for Passengers gratis on application. LOADING BERTH - East India Dock Basin, Blackwall, London. *Free Railway Tickets are granted from London to Southampton.* Experienced Surgeons and Stewardesses on every Steamer. Superior accommodation. Excellent Cuisine.

DONALD CURRIE & CO.,

LONDON—1, 2, 3, & 4, Fenchurch St., E.C.; MANCHESTER—15, Cross St.;
LIVERPOOL—25, Castle St.; GLASGOW—40, St. Enoch Square.



STANFORD LIBRARIES



1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

2. The second step is to gather relevant information and data. This may involve research, consultation with experts, or collecting data from various sources.

3. The third step is to analyze the information and data collected. This involves identifying patterns, trends, and relationships that can help in understanding the problem or question.

4. The fourth step is to develop a solution or answer. This involves applying the analysis to the problem or question and formulating a response that addresses the requirements.

5. The fifth step is to evaluate the solution or answer. This involves checking the response against the requirements and ensuring that it is accurate and complete.

6. The sixth step is to communicate the solution or answer. This involves presenting the response in a clear and concise manner, using appropriate language and format.

7. The seventh step is to reflect on the process. This involves thinking about the steps taken and the results achieved, and identifying areas for improvement.

8. The eighth step is to document the process. This involves recording the steps taken and the results achieved, so that the process can be repeated or improved in the future.

9. The ninth step is to share the solution or answer. This involves communicating the response to others, so that they can learn from the experience and apply the same principles to their own work.

10. The tenth step is to review the process. This involves looking back at the steps taken and the results achieved, and identifying areas for improvement.

11. The eleventh step is to implement the solution or answer. This involves putting the response into practice, so that it can be used to solve the problem or question.

12. The twelfth step is to monitor the results. This involves tracking the progress of the implementation, so that any issues can be identified and addressed.

13. The thirteenth step is to evaluate the results. This involves comparing the results against the requirements, so that the effectiveness of the solution or answer can be assessed.

14. The fourteenth step is to communicate the results. This involves presenting the findings to others, so that they can learn from the experience and apply the same principles to their own work.

15. The fifteenth step is to reflect on the results. This involves thinking about the outcomes and the process, and identifying areas for improvement.

16. The sixteenth step is to document the results. This involves recording the findings, so that they can be used to inform future work.

17. The seventeenth step is to share the results. This involves communicating the findings to others, so that they can learn from the experience and apply the same principles to their own work.

18. The eighteenth step is to review the results. This involves looking back at the findings and the process, and identifying areas for improvement.

19. The nineteenth step is to implement the results. This involves putting the findings into practice, so that they can be used to solve the problem or question.

20. The twentieth step is to monitor the results. This involves tracking the progress of the implementation, so that any issues can be identified and addressed.



Illustrated Official Handbook
OF
THE CAPE AND SOUTH AFRICA

A Résumé of
THE HISTORY, CONDITIONS, POPULATIONS,
PRODUCTIONS, AND RESOURCES
OF THE SEVERAL
Colonies, States, and Territories.

EDITED BY
JOHN NOBLE.

"Semper aliquid novi Africa affert."—PLINY.

J. C. JUTA & CO.,
CAPE TOWN. | JOHANNESBURG.

1893.

Entered at Stationer's Hall.

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DT 753
N 749 a



PREFACE.

It is nearly seven years since the 'Official Handbook of the Cape of Good Hope' was first published. During that period remarkable developments have taken place, not only in the Cape Colony, but in South Africa. To limit a description of the Country now to any one section of it would fail to convey a proper knowledge of its general circumstances, or do justice to the marvellous progress it has made and the splendid prospects it presents. This issue of the 'Official Handbook,' therefore, embraces some account of the past and present conditions, not only of the Cape of Good Hope, but also of the other Colonies, States, and Territories of South Africa. Its aim is to present to the public a fuller and more perfect knowledge than is commonly possessed of the natural history, products, and resources of this portion of the African Continent, and of the political and social changes which have marked the advance of colonisation throughout it.

In some degree, it is hoped, it may also be the means of familiarising the various communities of South Africa with each other, stimulating them to closer union in the promotion of the general interests of the country, and opening up vistas of greater possibilities in the future, when amalgamated by the bonds of a common fellowship they may form one people from the Cape to the Zambesi.

The Editor heartily tenders his thanks to the numerous friends who have assisted him with information, and particularly to those who have co-operated with him by contributing special papers for the present volume; viz., Messrs. R. Trimen, H. Bolus, D. E. Hutchins, P. D. Hahn, A. Douglass, D. Hutcheon, W. Spilhaus, T. Reunert, W. R. Hindson, J. D. Don, F. Spencer, E. Williams, P. Fitzpatrick, and Dr. C. Lawrence Herman. He has also pleasure in acknowledging the obliging and ready manner in which he was supplied with views of scenery and other objects, which have contributed to the illustration of the work.

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1893.

INFORMATION FOR PASSENGERS

BY THE

CASTLE MAIL PACKETS.

DATES OF DEPARTURE.

THE ROYAL MAIL STEAMSHIPS of the CASTLE MAIL PACKETS COMPANY, Limited, under contracts with the English and Colonial Governments, are despatched from the East India Dock Basin, Blackwall, London, E., every alternate Friday, and from Southampton on the following Saturday, for the Cape of Good Hope and Natal, proceeding *via* Madeira.

In addition, Intermediate Mail Steamships, calling at Las Palmas (Grand Canary), are also despatched every alternate Friday from London, and every alternate Saturday from Southampton, thus making a *regular* WEEKLY SERVICE from London and Southampton to South Africa and Delagoa Bay.

There are also sailings and through bookings from Continental Ports, and vessels are also despatched to Mauritius and Madagascar every four weeks. Steamers also call at St. Helena and Ascension during the period from 1st April to 30th September in each year.

RATES OF PASSAGE MONEY AND GENERAL INFORMATION.

The rates of passage money (including in all three classes a liberal table, and the use of beds, bedding, cabin linen and furniture) are as follows:—

TO	By the Company's Royal Mail Steamers from London or South- ampton.			By the Company's Intermediate Mail Steamers from London, Southampton, Hamburg, Bremen, Flushing, Amsterdam, Rotterdam, or Antwerp.			
	1st Class.	2nd Class.	3rd Class Closed Cabins.	1st Class.	2nd Class.	3rd Class.	
						Closed Cabins.	Open Berths on Main or Orlop Deck, for Men only.
	Gs.	Gs.	Gs.	Gs.	Gs.	Gs.	Gs.
LISBON	—	—	—	—	—	—	—
*MADEIRA... ..	15	10	6	13	8	6	—
GRAND CANARY... ..	—	—	—	14	9	6	—
†ST. HELENA	—	—	—	36	23	13	—
†ASCENSION, <i>via</i> St. Helena	—	—	—	43	28	16	—
CAPE TOWN	39	25	16	36	23	13	10
MOSSEL BAY	42	27	17	39	25	14	11
KNYSNA	42	27	17	39	25	14	11
ALGOA BAY (Port Elizabeth) }	42	27	17	39	25	14	11
EAST LONDON	43	28	18	40	26	15	12
NATAL	44	29	19	41	27	16	12
DELAGOA BAY	46	31	21	43	29	18	14
MAURITIUS	50	34	23	50	34	23	—
MADAGASOAR	50	34	23	50	34	23	—
	£	£	£	£	£	£	£
BEIRA	50	33	20	50	33	20	16

* The homeward fares from the South African ports, third class, by both Mail and Intermediate Steamers, are the same as for closed cabin passages by Intermediate Steamers outwards. The homeward fares from Madeira are 12 guineas first class, 8 guineas second class, and 6 guineas third class, by Mail Steamer, and 10 guineas first class, 7 guineas second class, and 6 guineas third class, by Intermediate Steamers; from Grand Canary, 11 guineas first class, 7 guineas second class, and 6 guineas third class; and the passage rates from Madeira or Las Palmas to South and East African ports and Mauritius are 5 guineas first class, 3 guineas second class, and 2 guineas third class, less than from England.

† The homeward fares from St. Helena are 34 guineas first class, 23 guineas second class, and 16 guineas third class, and from Ascension 30 guineas first class, 19 guineas second class, and 16 guineas third class.

For other homeward fares see Tariff.

RETURN PASSAGES BY ROYAL MAIL STEAMSHIPS.

BETWEEN LONDON AND	1st	2nd	3rd
	£ s. d.	£ s. d.	£ s. d.
MADEIRA	25 10 0	17 0 0	11 6 9
CAPE TOWN	73 14 0	47 5 0	27 8 0
MOSSEL BAY	79 7 6	51 0 0	29 6 0
KNYSNA	79 7 6	51 0 0	29 6 0
ALGOA BAY	79 7 6	51 0 0	29 6 0
EAST LONDON	81 5 6	52 18 6	31 3 9
NATAL	83 3 0	54 16 0	33 1 6
MAURITIUS	94 10 0	64 5 0	43 9 6
MADAGASCAR	94 10 0	64 5 0	43 9 6

RETURN PASSAGES BY INTERMEDIATE MAIL STEAMERS.

BETWEEN LONDON AND	1st	2nd	3rd
	£ s. d.	£ s. d.	£ s. d.
GRAND CANARY	23 12 6	15 2 6	11 6 6
CAPE TOWN	68 1 0	43 9 0	24 11 6
ALGOA BAY	73 14 0	47 5 0	26 9 0
EAST LONDON	75 12 0	49 3 0	28 7 0
NATAL	77 10 0	51 0 6	30 4 9

A reduction of 10 per cent. off the amount of two single fares is also made on Return Tickets to the other Ports at which the Intermediate Steamers call. Return Tickets are available for six months, and can be extended for a further six months on repayment of half the reduction, and for a further period on repayment of the balance of the reduction. In the event of a Return Ticket being taken and the homeward passage not used, a refund of the difference between the amount paid and the single fare will be made on application to the office at which the passage was taken.

Children are charged according to their ages, and the fare for a family will be quoted on these particulars being furnished to Messrs. Donald Currie & Co.

Servants are allowed to wait on their masters and mistresses during the day, and female servants take their meals at the table provided for the children of first-class passengers. When second-class fare is paid for them they can generally be berthed in the same cabin with the children. If third-class fare only is paid, they require to sleep in that class.

A cabin can be retained for the exclusive use of a smaller number of passengers than it is arranged to accommodate, on payment of an extra fee for the vacant berths. Deck-cabin berths are charged at the same rate as those on the main deck.

A deposit of half the fare must be paid to secure a passage, and the balance at the Company's offices previous to embarking.

If preferred, however, passengers joining the steamships at Southampton can pay their balances on board in cash.

On payment of the difference between the through fares, passengers wishing to continue the voyage beyond the ports for which they originally booked, can do so either by the same steamship or by a later one within a month of their landing. The difference of fare is prepayable, and will be received by the Purser on board the vessel; or at the company's agencies in the Colony, in the event of the passengers having landed. If desirous of staying at a port before the one for which they have engaged passages, they can break the voyage and proceed within two months by a subsequent vessel of the line in which suitable accommodation is vacant. Passengers can also transfer to a class above that for which they booked, by paying the difference between the fares at the company's offices before starting, or else to the Purser on board the vessel during the voyage previous to transferring.

Passages can be prepaid in England or South Africa for friends on the other side, and the advices of such passages being available can be sent by cable at a small additional expense if wished. Remittances of small amounts can be made to passengers in the same way.

A surgeon, fully qualified both medically and surgically, and stewardesses, whose services are rendered without charge to passengers, are carried by each steamship; and there are provided for the convenience of first-class passengers a smoking-room (on deck), ladies' sitting-room or drawing-room, bath-rooms, with hot and cold water laid on, library and piano, and in some cases an organ. A piano is also placed in the second saloon, and bath-rooms, supplied with hot and cold water, are provided for second-class passengers, who likewise have the use of the library.

A cow is taken in order to supply fresh milk.

A system of electric lighting, extending throughout the first, second and third class cabins, refrigerating chambers, and electric or pneumatic bells have been added to all the Mail and most of the Intermediate Steamers of the Line.

Passengers embark either in London or at Southampton as is the more convenient to themselves.

The hour of leaving the docks in London depends upon the tide, but the departure of the Tender from Southampton is at 1.30 p.m. for the Mail Steamers, and at 12.30 p.m. for the Intermediate Steamers. Those proceeding by rail from London require to leave town at latest by the "Castle Line" Express, which is despatched to Southampton each alternate Saturday, at 11.40 a.m. for the Mail Steamers, and at 10.45 a.m. for the Intermediate Steamers.

Passengers wishing to join the Steamers at Southampton are given free Railway Tickets from Waterloo to that Port by the "Castle Express," and passengers coming from the West of England are given free Railway Tickets from Plymouth to Southampton.

A Through-Carriage to Southampton (1st, 2nd, and 3rd class), for the convenience of passengers from the West of England, is also attached on each Friday (if notice is given to the Railway Company) to the Train leaving Penzance at 10.45 a.m., and passengers can join at the intermediate Stations. Passengers from the district west of Plymouth are also provided with free board and lodging the night previous to embarkation. They are also met at the Station, and their baggage shipped free.

A Special direct service of Trains to Southampton has been arranged (until further notice) from the principal provincial towns each Friday in connection with the sailings of the Mail Steamers of the "Castle" Line. By this service passengers via Cheltenham are due at Southampton at 8.13 a.m. Saturday, in ample time to embark by the Steamers. Passengers by the Castle Steamers holding through tickets are also carried through to Southampton (including conveyance by omnibus between the London Termini) from Edinburgh, Glasgow, and the principal Stations on the London and North Western, Great Northern, and Midland Railways. For particulars apply to the Railway Companies. The Castle Company take no responsibility with regard to the times or other particulars of these trains, nor do their steamers wait for them.

Homewards the Mail Steamers call at Madeira and Plymouth. Passengers can land at Plymouth, or in London. The Intermediate Steamers call at Las Palmas and come thence to London direct.

PASSENGERS FROM CONTINENTAL PORTS.

For the advantage of passengers coming from the Continent, passengers are booked through from Bremen, Hamburg, Rotterdam, Amsterdam, Flushing, and Antwerp (via London) to the South African ports and Delagoa Bay at rates which can be ascertained at the Company's offices or agencies. These fares include conveyance to London, board and lodging at good hotels, and free transfer of the quantity of baggage allowed freight free. The Agents are— at Bremen, Mr. F. Missler; Hamburg, Hugo and Van Emmerik, and Messrs. Falck & Co.; Flushing, The Zeeland Steamship Co.; Rotterdam, Messrs. C. Cornelder & Son; Amsterdam, Messrs. Bruinier & Co.; and Antwerp, Mr. F. Huger and Mr. R. Berns. From Frankfort passengers are also booked through at the same rates, but their hotel expenses are not borne by the Company. The Frankfort Agents are Messrs. Schottenfels & Co.

*CONNECTION WITH THE SERVICES OF THE
BRITISH INDIA STEAM NAVIGATION COMPANY
AND MESSAGERIES MARITIMES.*

By the route via Mozambique and Zanzibar, passages can be obtained between the ports served by the Castle Mail Packets and the places touched by the British India Company's steamships to India, Arabia, Persia, Burmah, and Queensland, among which may be mentioned Zanzibar, Aden, Colombo, Galle, Calcutta, Bombay, Goa, Madras, Burmah, Rangoon, Java, Batavia, Brisbane, Kurrachee, and Baghdad.

Passengers can also proceed from England to the Cape, and thence via the East African Coast, Aden, and the Suez Canal back to England.

Full particulars can be obtained at all Messrs. Donald Currie & Co.'s Agencies. The Castle Mail Packets Company will not be responsible for any expense or loss of time, &c., which passengers may incur on this route; but every information as to the connections will be given on application.

By means of the service to Mauritius, at which island the steamers of the Messageries Maritimes and British India Company connect, passengers can proceed from South Africa to Australia, and all other places on these Companies' routes. The

rates of passage money from Mauritius to the South African Ports are:—

		1st Class.	2nd Class.	3rd Class.
To Natal	... ..	15 Guineas	11 Guineas.	8 Guineas.
Port Elizabeth	... ..	18 "	13 "	9 "
Cape Town...	... ..	20 "	15 "	11 "

The names of Agents in Australia will be found in the list at the end of this book.

THROUGH PASSAGES BETWEEN SOUTH AFRICA AND AMERICA.

Passages can now be booked through between America and South Africa. For particulars apply to the Offices throughout America of Wells, Fargo & Co.'s Express, the American Line, Cunard Line, and White Star Line, or the Agencies of the Castle Mail Packets Company, Limited, in South Africa.

TABLE, AND DESCRIPTION OF THE VESSELS.

The Castle Line, since the commencement of its South African Service—now about twenty years ago—has been very favourably known for the excellence and variety of the table provided. In the first class the arrangements are—Tea, coffee, &c., served in the cabins at 6 a.m., dressing bell at 8 a.m., breakfast from 8.30 till 10 a.m., luncheon at 1 p.m., dressing bell at 6 p.m., and dinner at 6.30 p.m., while at 4 p.m. those who appreciate the luxury can have afternoon tea.

At the three principal meals there is provided every possible variety of fish, flesh, and fowl, of such excellence as has surprised passengers who were unacquainted with this line. A separate and suitable table—breakfast at 8 a.m., dinner at 12.30 p.m. and tea at 5.30 p.m.—is provided for children.

Each vessel carries a refrigerating chamber amply supplied with sufficient ice for the voyage.

The meals in the second saloon are—Tea, coffee, &c., served in the cabins at 6 a.m., breakfast at 8 a.m., lunch at 1 p.m., afternoon tea at 4 p.m., dinner at 6 p.m., while those requiring it can have supper of biscuits, &c., at 8 p.m. The food is of the same quality as that provided in the saloon, and the dishes are only slightly less numerous.

In the third class the food is also of the best quality, and the meals are—Breakfast at 8 a.m., dinner at 12.30 p.m., tea at 5.30 p.m., biscuits, bread and cheese at 8 p.m. In this class also a free table is provided.

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Each vessel carries a refrigerating chamber amply supplied with sufficient ice for the voyage.

The meals in the second saloon are—Tea, coffee, &c., served in the cabins at 6 a.m., breakfast at 8 a.m., lunch at 1 p.m., afternoon tea at 4 p.m., dinner at 6 p.m., while those requiring it can have supper of biscuits, &c., at 8 p.m. The food is of the same quality as that provided in the saloon, and the dishes are only slightly less numerous.

In the third class the food is also of the best quality, and the meals are—Breakfast at 8 a.m., dinner at 12.30 p.m., tea at 5.30 p.m., biscuits, bread and cheese at 8 p.m. In this class also a free table is provided.

The following is a Bill of Fare chosen at random from the Steward's Book :—

SALOON.		
<i>Breakfast from 8.30 to 10.0.</i>	<i>Luncheon at 1.0.</i>	<i>Dinner.</i>
Porridge.	SOUP.	HORS D'ŒUVRES.
Findon Haddock.	Kidney.	SOUP.
Fried Plaice.	Hot.	À la Royale.
Grilled Ham.	Soles au Gratin.	FISH.
Oxford Sausages.	Escalops of Chicken, and	Salmon, with Genoese
Chops and Steaks from the	Cucumber.	Sauce.
Grill.	Chops and Steaks from	ENTRÉES.
Eggs.	the Grill.	Lambe' Sweetbreads à la
Curry and Rice.	COLD.	Toulouse.
Chip and Mashed Potatoes.	Mayonnaise of Lobster.	Compote of Pigeons.
COLD.	Roast Lamb, with Mint	JOINTS.
Ham.	Sauce.	Roast Sirloin of Beef, with
Beef.	Roast Chicken.	Horseradish.
Lamb.	Anglo-German Sausage.	Roast Saddle of Mutton and
Brawn, &c.	Game Pie.	Red Currant Jelly.
—	York Ham.	Ox Tongue.
Toast.	Pate de Foie Gras.	POULTRY AND GAME.
Rolls.	Anchovy Paste.	Stewed Duck, and Olives.
Jam and Marmalade.	Salad, Assorted.	Larded Pheasant, with
Tea, Coffee and Cocoa.	Buns, Scones, and Oat	Bread Sauce.
FRUIT.	Cakes.	Chicken Curry and Rice.
Assorted.	Compote of Prunes.	VEGETABLES.
	Neapolitan Ices.	Assorted.
	FRUIT.	SWEETS.
	Assorted.	Iced Pudding.
	—	Peaches in Jelly.
	Coffee.	Swiss Pastry.
		Apple Tart.
		—
		Salad, dressed.
		Cheese, Gorgonzola and
		Cheddar.
		DESSERT.
		—
		Tea and Coffee.
SECOND SALOON.		
<i>Breakfast at 8 a.m.</i>	<i>Luncheon at 1 p.m.</i>	<i>Dinner at 6 p.m.</i>
Porridge.	SOUP.	Soup à la Royale.
Findon Haddock.	Kidney.	Fillets of Silver Fish.
Rump Steak, with Tomato	Hot.	Mutton Cutlets à la
Sauce.	Steak Pie.	Duchesse.
Deville Kidneys on Toast.	Chops.	Roast Beef.
Eggs to Order.	COLD.	Corned Ox Tongue.
Lambe' Liver and Bacon.	Salmon.	Roast Chicken.
Curry and Rice.	Roast Beef.	Curry and Rice.
Chip Potatoes.	Roast Mutton.	VEGETABLES.
COLD.	Corned Beef.	Assorted.
Roast Mutton.	Anchovy Paste.	—
—	—	Rice Pudding.
Toast, Rolls, Jam and	Salad, Assorted.	Fruit Tart.
Marmalade.	—	Coventry Puffs.
Tea, Coffee and Cocoa.	Buns, Scones, &c.	DESSERT.
	Neapolitan Ices.	—
		Cheese.

THIRD SALOON.

<i>Breakfast.</i>	<i>Dinner.</i>	<i>Tea.</i>
Porridge.	Vegetable Soup.	Fresh Herring.
Findon Haddock.	Roast Mutton.	Cold.
Grilled Mutton Chops.	Corned Beef.	Roast Mutton.
Irish Stew.	Assorted Vegetables.	Roast Beef.
Bread and Butter.	Apple Tart.	Bread and Cheese.
Tea and Coffee.	Bread and Cheese.	Buns.
		Jam and Marmalade.
		Tea and Coffee.

Wines, ales, mineral waters and spirits, of which a large and well-selected stock is always carried, are supplied on board at moderate prices. Tobacco and cigars can also be obtained on board.

The following list shows the descriptions and prices (subject to alterations, without further notice, caused by the market):—

	Bot.	½-Bot.
SHERRY, Vino de Pasto	4/0	—
Pale Dry	3/0	—
PORT, Good Old Light	3/6	—
CLARET, Latour Carnet	4/0	—
Château Picon	2/6	1/6
HOCK, Rudesheim	4/0	—
MOSELLE, Sparkling	5/0	—
CHAMPAGNE, Pommery & Greno's "Extra Sec"	10/0	5/6
Moët & Chandon's "Brut Imperial"	10/0	5/6
Heidsieck's "Dry Monopole"	10/0	5/6
Perrier Jouet, 1889	10/0	5/6
Moët & Chandon's "Sparkling Sillery"	9/0	5/0
CAPE WINES, Sherry, Pontac, Hermitage	} 2/0	—
Drakenstein (Hock)		
BRANDY, Hennessy's	4/0	—
Hennessy's ***	5/6	—
WHISKY, Scotch or Irish, First Quality	3/6	—
GIN, Old Tom or Hollands	2/6	—
RUM, Jamaica	2/6	—
MINERAL WATERS, Soda, Lemonade, Seltzer, Potash, Ginger Ale, Indian Tonic	0/4	—
JOHANNIS	0/6	—
ALE and STOUT	1/0	0/6
LAGER BEER	1/0	0/6
LIQUEURS, Noyeau, Curaçao, Maraschino, Van der Hum, Chartreuse	—	3/6
CORDIAL Lime Juice	2/0	—
CIGARS, Bock, 6d. each; Por Larranagas, 4d. each; Manilla, 2d. each.		
CIGARETTES, Finest Virginian, 5d. per packet of 10; 2/0 per tin of 50.		
Egyptian, Sossidi Frères, 1/9 per tin of 25.		
TOBACCO, Black Cavendish, 2/6 per lb.; Cut, 4/0 per lb.		
PLAYING CARDS, 1/6 per pack.		
SPIRITS, 6d. per glass.		

A short description of the general arrangement of the steamships will be of interest, and may be followed without difficulty by the aid of the following account of the "Tantallon Castle" and "Dunottar Castle," and the sketches in the text,

The new Cape Royal Mail Steamships "Tantallon Castle" and "Dunottar Castle" were built for the Castle Mail Packets Company, Limited, by the Fairfield Shipbuilding and Engineering Company, Limited, of Glasgow, and are the sixth and seventh mail steamers built by that firm for the Castle Line.

The register tonnage of the "Tantallon Castle" is 5,700 tons, and of the "Dunottar Castle" 5,465 tons, and the dimensions are as follows:—length, 456 and 435 feet (over all); breadth 50½ and 50 feet; depth 35 and 36 feet. The hulls are built entirely of steel, and have internally continuous cellular double bottoms, divided both longitudinally and transversely into compartments. The vessels have respectively ten and eight vertical watertight bulkheads, which extend to the upper deck, and are spaced and



DINING SALOON.

constructed in accordance with the recommendations of the "Bulkhead" Committee appointed by the Board of Trade.

The models of the vessels combine the qualities necessary for fast steaming and of seaworthiness, stability, and capacity. The hulls of the Castle Liners are painted a light French grey, relieved with white on the superstructure, and by a deep red on the bottom, the whole effect presenting a graceful and yachtlike appearance.

The first-class dining saloons, which extend across the full width of the ship, are panelled in dark mahogany, relieved with satinwood. The ceilings are painted ivory white, and are divided into panels, which are enriched with a delicately-tinted

ornament. Occupying the spaces between the entrance doors to the saloon are bookcases, and on either side of these are arched and panelled recesses. At the other end of the room will be found a piano and organ. The port-holes are effectively arranged under semicircular arches, and are draped with richly-coloured curtains. In the centre of the ceiling is a large well, surmounted by a cupola of stained glass, and open on three sides to the music room, which is situated above the saloon. The saloons will seat about 160 passengers, and are furnished with two large tables, and a number of separate tables for small parties.

The Music Rooms, on the upper deck and above the saloons, are panelled with different shades of satinwood. Comfortable



R.M.S. "TANTALLON CASTLE"—DRAWING ROOM.

lounges and a handsome Broadwood piano are provided. The side windows of this apartment are of stained glass, and some contain views of old Scotch Castles, from which the vessels take their names.

The Smoking Rooms, which are placed on the upper deck, are finished in oak and walnut and have an oak parquet floor, the ceiling being decorated similarly to the other saloons. In these rooms are placed comfortable easy-chairs and couches covered with red-brown morocco, with here and there tables for whist, etc.

The State Rooms are a model of comfort and convenience, being provided with electric light, electric bells, etc., etc. The Bath Rooms contain baths carved out of blocks of solid marble.

The floors are laid in mosaic, and a constant supply of hot and cold water is laid on. Sitz baths, warm and cold sprays, wave, douche, and shower baths can be had at will. An interesting feature is a Barber's Shop, fully equipped, and under the superintendence of an experienced hairdresser. Hair is brushed by electricity.



R.M.S. "DUNOTTAR CASTLE"—MUSIC ROOM.

The Second-Class Saloons, which are forward, will seat 100 passengers in each. They are handsomely fitted up, each contains a library and a piano, and is furnished with revolving chairs, an unusual luxury for second-class passengers. The state

rooms in this class are very comfortable, being furnished with spring mattresses, sofas, and having the electric light, etc. The Third-Class accommodation is remarkably comfortable, and is far beyond the ordinary style in this class.

The steamers are lighted throughout by electricity. In addition to the ordinary electric fittings, which extend to the crews' quarters, the shaft tunnel, etc., etc., a powerful search light, and ships' signal lamps are provided. A complete system of Electric Bells has been fitted, and a Cold-Air Refrigerator of 20,000 cubic feet has been constructed, with three cold chambers for storing meat, fish, game, milk, vegetables, butter, etc., for use on the voyage.

The Engines are of 7,500 and 7,000 respectively horse-power,



R.M.S. "TANTALLON CASTLE"—SMOKING ROOM.

and are of the quadruple and triple expansion types. Steam is supplied by large boilers with corrugated furnaces. The boilers have been constructed of steel, under the superintendence of the Board of Trade and Lloyds' Surveyors.

The "Tantallon Castle" has made the passage from Southampton to Cape Town in 15 days 16 hours, and from Cape Town to Plymouth 15 days 0 hours; and the "Dunottar Castle" has taken 15 days 23 hours outwards and 15 days 7 hours homewards. Both vessels have proved themselves to be remarkably steady sea-boats.

The other Mail Steamers of the Line have also made remarkably rapid runs, and the new Mail Steamer now under construction

will mark a further development in meeting the requirements of the trade.

NOTE.—In the Third Class accommodation of the “Arundel Castle” and “Pembroke Castle” there are a few Two-berthed Cabins which can be secured by a payment of two guineas per berth in addition to the ordinary closed cabin rates.



QUARTER DECK—PROMENADE.

BAGGAGE.

The shipment of their baggage is usually one of the great difficulties of passengers, but trouble in this respect is removed as far as possible by Messrs. Donald Currie & Co. A liberal allowance of 20 cubic feet, freight free, is made to each adult passenger, first and second class, and 10 cubic feet third class, and to children in the proportion which their fares bear to the ordinary passage rates. Any quantity in excess of these allowances is charged at the rate of 2s. per cubic foot, and, if a large quantity is taken, it will be advisable to ship as cargo all in excess of the measurement allowed free. Packages for shipment as cargo should not bear the name of the passenger nor a baggage label, but only a distinguishing mark and number above the name of the port at which they are to be landed. Such packages should also be marked “Cargo.”

All heavy baggage must be shipped in London and should be forwarded to the East India Dock Basin, Blackwall, consigned to

Messrs. Donald Currie & Co. Only a handbag or small package can be taken by the special train to Southampton.

The portmanteau or box for the cabin must not exceed 14 inches in height, 2 feet in breadth, or 3 feet in length, in order to go under the berth, and for convenience should not be quite so wide or so long as those measurements.

The remainder of the baggage is divided into two classes, viz., that "not wanted on the voyage," and that "wanted." Packages belonging to the latter class are placed conveniently in the baggage room, and are brought up on deck in charge of an officer once a week, so that passengers can get from them any articles they may require.

On each package of baggage should be distinctly painted the name of the passenger, and port of destination; on each, also, should be pasted one of the labels which the Company supply printed on different coloured papers for the respective ports touched at.

Initial labels are also forwarded to passengers who wish for them.

These labels are sufficient to ensure the shipment of baggage forwarded in advance by rail, if Messrs. Donald Currie & Co. are at the same time advised by post of its despatch.

When forwarded by London local carrier, a shipping note should also be obtained from the Company's offices, and sent with the baggage to ensure admission into the docks.

Messrs. Donald Currie & Co. have made arrangements by which passengers can have their baggage collected at reduced charges by carman, or Messrs. Pickford & Co., from all parts of London and suburbs, and the railway companies will receive at all their stations and will forward through to the docks, passengers' baggage entrusted to their care; and they will also deliver to the Castle Steamers any packages which passengers may bring with them to the London termini.

In any case baggage should be at the docks, if in large quantity, two clear days, and otherwise one clear day at least, before the departure of the steamship, but it may be sent there as long before that time as may be convenient. Small packages for the cabin can be taken on board when passengers embark. The Company undertakes no responsibility with regard to baggage unless special arrangements to that effect are made in writing.

Passengers should hand all money and valuables to the captain of the steamer immediately on embarking.

The Company bears the expenses of the outward dock dues and of shipping in London and at Southampton and Flushing, and of landing at the South African ports and St. Helena passengers, on the quantity of baggage allowed freight free.

No duty is charged on ordinary personal baggage by either the Cape or Natal Government. On most descriptions of merchandise an *ad valorem* duty of from 10 to 15 per cent. is levied in the Cape Colony, and about 7 per cent. in Natal. A duty of one pound per barrel is imposed on guns, and on revolvers and pistols one of ten shillings each weapon. The Natal Government has given notice that all weapons taken into that Colony by passengers must be delivered to the Custom House authorities on landing for the purpose of registration under penalty of forfeiture if this regulation is neglected.

In London or at Southampton the Custom House officers do not require to examine any baggage or goods shipped, but all is examined when landed in Madeira, St. Helena, the South African or other ports. Baggage coming from the Continent for transshipment is however subject to examination, except when brought by the service of the Zeeland S.S. Co., in connection with the London, Chatham and Dover Railway, by which route it can be "registered" through to the docks. Passengers forwarding baggage in bond by other routes are requested to send Messrs. Donald Currie & Co. the keys of all locked packages, and to be careful not to place in their baggage cigars, tobacco, spirits, or anything liable to duty in England, as it is often impossible to tranship "in transit," and in any case the expense of so doing is great.

OUTFIT.

The only outfit that a passenger to the Cape really needs is some warm clothing for the channel and commencement of the voyage, and some of a lighter texture to wear after Madeira is passed. English summer or yachting clothes are perfectly suitable for the latter purpose. Sufficient linen, etc., to last the whole voyage should be taken.

English summer clothing of light texture and colour is also that which is most generally worn in the towns of South Africa, and special clothes need only be provided by those who have decided to proceed into the interior, where clothing of a material not easily torn is necessary.

A deck chair is frequently taken, and is in many cases a useful luxury. Folding chairs are best suited for the purpose, as they can be carried about easily afterwards.

In a question such as outfit, which depends so entirely on individual tastes and habits, it is impossible to give hard-and-fast rules.

LENGTH OF PASSAGES.

The average length of the passages of the Castle Royal Mail Steamships between Southampton and Cape Town is about 17 days; and the shortest time in which the voyage has yet been made by these vessels is 15 days 0 hours by the "Tantallon Castle." The passage to Madeira occupies about three and a half days, and thence to Cape Town thirteen or fourteen. Ascension is only touched at on the homeward voyage, and passengers from England for that Island tranship at St. Helena.

From Cape Town to Algoa Bay is about thirty hours' run, and the voyage from the latter port to Natal occupies about the same time.

The passage from Natal to Delagoa Bay occupies about thirty hours.

The round voyage from England to the Cape or Natal and back in the same vessel occupies about 9 weeks, or to Cape Town and back in the first homeward vessel 7 weeks.

The distance from Natal to Mauritius is about 1,600 miles, and occupies about six days; and the through passage from England to Mauritius occupies about 31 days, including stoppage in port.

Time tables showing the approximate dates of arrival at and departure from the various South African and East Coast Ports and Mauritius are issued by Messrs. Donald Currie & Co., and will be supplied on application.

Below two tables of distances in miles are annexed.

TABLES OF DISTANCES.

			Cape Town.
		Madeira.	4,673
London.	Southampton.	1,306	5,978
	202	1,508	6,181

(From Southampton anchorage to Needles is 22 miles.)

				Delagoa Bay.	Beira.
				300	785
			Natal.	253	553
			E. London.	131	384
			*Algoa Bay.	186	317
			Mossel Bay.	428	559
			Cape Town.	242	428
				812	1,112
					1,597

* From Cape Town to Algoa Bay direct, not calling at Mossel Bay, is 418', to 10' less than shown with above scale, which alters all subsequent totals by 10' to subtract.

F L E E T.

Steamer.	Tons.
NEW STEAMER	(Building)
NEW STEAMER	(Building)
NEW STEAMER	(Building)
"TANTALLON CASTLE"	5,636
"DUNOTTAR CASTLE"	5,465
"ARUNDEL CASTLE"	4,588
"ROSLIN CASTLE"	4,487
"NORHAM CASTLE"	4,392
"HAWARDEN CASTLE"	4,380
"DOUNE CASTLE"	4,045
"LISMORE CASTLE"	4,045
"PEMBROKE CASTLE"	3,878
"DRUMMOND CASTLE"	3,663
"GARTH CASTLE"	3,660
"GRANTULLY CASTLE"	3,454
"HARLECH CASTLE"	3,264
"WARWICK CASTLE"	3,056
"METHVEN CASTLE"	2,605
"VENICE"	511

DISTANCES AND FARES.

	Miles.	Hours Occupied.	F A R E S.					
			1st Class.		2nd Class.		3rd Class.	
			£	s.	£	s.	£	s.
Cape Town to Kimberley by Rail	647	32½	8	1	5	7	10	2
Cape Town to Vryburg by Rail	774	39	8	11	4	5	17	8
Cape Town to Johannesburg (Park Stm.) via Bloemfontein by Rail	1,013	50	11	11	9	7	19	6
Cape Town to Pretoria by Rail	1,040	52	11	18	9	8	5	6
Algoa Bay to Kimberley by Rail	485	27	6	1	3	4	0	10
Algoa Bay to Johannesburg (Park Station) by Rail	713	50	8	4	0	5	13	5
East London to Johannesburg (Park Station) by Rail	665	37	7	13	0	5	6	0
NATAL ROUTE.								
Durban to Charlestown ...	303	17½	3	16	0	2	10	8
Charlestown to Barberton	183	—	—	—	—	—	—	—
Durban to Johannesburg	about 483	—	6	1	0	4	6	6
Durban to Pretoria	511	—	6	8	0	4	12	0
DELAGOA BAY ROUTE.								
Lorenzo Marques to Krokodilpoort	113	8	1	8	6	1	2	0
Lorenzo Marques to Nelspruit ...	129	9	1	12	0	1	5	0
Krokodilpoort to Barberton by Coach	40	—	1	10	0	—	—	—
Nelspruit to Lydenburg by Road	50	—	—	—	—	—	—	—
Lorenzo Marques to Pretoria	350	— about	4	8	3	3	9	1
Lorenzo Marques to Johannesburg	377	—	—	—	—	—	—	—
BEIRA ROUTE.								
Beira to Fontesvilla by Steamer	40	—	1	5	0	—	—	—
Fontesvilla to Chimio by Rail	118	—	2	10	0	—	—	—
Chimio to Umtali by Waggon	80	—	3	0	0	—	—	—
Umtali to Salisbury by Road	149	—	—	—	—	—	—	—
OVERLAND ROUTE TO MASHONALAND AND MATABELELAND.								
Via BECHUANALAND AND PRETORIA.								
Cape Town to Mafeking by Rail	872	48 hours	9	15	4	6	13	8
Mafeking to Buluwayo ...	550	5½ days	22	10	0	—	—	—
Cape Town to Pretoria by Rail	1,040	52 hours	11	18	9	8	6	6
Pretoria to Buluwayo	500	6 days	22	0	0	—	—	—

Both the above Routes meet at Buluwayo, whence the journey is continued as follows:—
 Buluwayo to Salisbury, 260 miles, by post-cart, weekly; fare £12. Time about 5 days.

About £5 by post-cart, or £2 10s. by waggon.

By post-cart, weekly.
 8 6 6 | 4 13 3
 By post-cart, weekly.

**BOOKS, PAMPHLETS, MAPS, &c., ISSUED BY
MESSRS. DONALD CURRIE & CO.**

- "The Guide to South Africa," edited by A. Samler Brown and G. Gordon Brown. 376 pages, with twelve-coloured maps, two plans, and two sectional diagrams, 2s. 6d.
 - "Illustrated Handbook of South Africa," 73 pages, 3d., post free, 4d.
 - "Handbook of Rhodesia," 3d., post free, 4d.
 - "By the Castle to the Cape" (reprinted from the *Scotsman*), 6d.
 - "Illustrated Handbook of Madeira and the Canaries," 3d., post free, 4d.
 - "South African Health Resorts; the Voyage to South Africa and Sojourn there," 3d., post free, 4d.
 - "Handbook of Information for Passengers," with a map, gratis.
 - "Routes to the Goldfields," with distances, means of conveyance, and fares, gratis.
 - "Illustrated Handbook of the Goldfields of South Africa," with map and various statistics regarding output, &c., 3d., post free, 4d.
 - "Views of the Fleet," 60 pages, with illustrations of the various vessels of the Castle Line Fleet, and a description of a voyage to the Cape ("Athletic Sports on Summer Seas"), reprinted from the *Westminster Budget*, gratis, post free, 2d.
 - "The Castle Line Folder Maps of South Africa," 2 ft. 9 ins. by 2 ft. 5 ins., gratis, post free, 2d.
 - "The Castle Line Roller Map of South Africa, 1896," 4 ft. 4 ins. by 3 ft., showing railways, products, etc., etc., 2s., carriage free, 2s. 9d.
 - "The Castle Line Atlas of South Africa," containing 30 maps and diagrams, with an account of the geographical features, the climate, the mineral and other resources, the history of South Africa, and an index of over 6,000 names of places, 3s. 6d., post free, 4s.
- The following can be obtained from MESSRS. DONALD CURRIE & Co.*
- "The Official Handbook of the Cape and South Africa," by J. Noble, 567 pages, with a map and numerous illustrations, 2s., post free, 3s.
 - Brown's "Madeira and the Canary Islands," a practical and complete guide for the use of invalids, tourists, and residents, with eleven maps and five plans in three colours, by A. Samler Brown, 2s. 6d.

LITHOGRAPHS AND PHOTOGRAPHS.

Lithographs in sixteen colours, from the picture of the "Dunottar Castle leaving the Thames," by Mr. W. L. Wylie, A.R.A., exhibited recently in the Royal Academy :—

Large size, 4 ft. 2 ins. by 2 ft. 5 ins. wide, 5s.

Intermediate size, 3 ft. long by 1 ft. 9 ins. wide, 3s. 6d.

Small size, 2 ft. long by 1 ft. wide, at 6d.

Photographic reproductions of "Castle" Steamers (Tantallon Castle, Dunottar Castle, Arundel Castle, Roslin Castle, Norham Castle, Hawarden Castle, Pembroke Castle, Doune Castle, Lismore Castle, Drummond Castle, Garth Castle, Grantully Castle, Harlech Castle, Warwick Castle, Dunbar Castle, Methven Castle), suitable for keeping as souvenirs of the voyage.

- Unmounted, or mounted on cardboard, about 20 ins. by 15 ins., 6d. each, or post free, 9d. each.

Enclosed in suitable easel-portfolio, 2s. 6d. each, or post free, 3s. each.

Unlettered Proofs, mounted, 1s. each, or post free, 1s. 3d. each.

Easel-Portfolios, containing reproductions of twelve steamers, price 7s. 6d., or post free, 8s. 6d. each.

Easel-Portfolios, containing six exterior and interior views of the "Tantallon Castle" and of the "Dunottar Castle," 5s. each, or post free, 6s. each.

OFFICES OF THE CASTLE LINE.

LONDON—3, Fenchurch street, E.C. MANCHESTER—15, Cross street.
 WEST END AGENCY—Thos. Cook and LIVERPOOL—Castle street.
 Son, 13, Cockspur street. GLASGOW—40, St. Enoch square.

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CONTENTS.

CHAP.	PAGE
I.—SOUTH AFRICA: ITS POLITICAL DIVISIONS AND PHYSICAL FEATURES	1-31
II.—GEOLOGY, FOSSILS, AND MINERALS OF SOUTH AFRICA ..	32-49
III.—VĒRTEBRATE FAUNA OF SOUTH AFRICA	50-90
IV.—FLORA OF SOUTH AFRICA	91-123
V.—WOODS AND FORESTS	124-137
VI.—DISCOVERY AND EARLY OCCUPATION OF THE CAPE BY EUROPEANS	138-166
VII.—BRITISH RULE DURING THE CENTURY	167-202
VIII.—THE CAPE GOVERNMENT, INSTITUTIONS, ROADS, RAILWAYS, AND HARBOURS	203-232
IX.—POPULATION, METROPOLIS, COMMERCE, FINANCES, BANKING, AND INDUSTRIES	233-258
X.—LAND AND AGRICULTURAL PRODUCTIONS	259-266
XI.—VITICULTURE	267-272
XII.—LIVE-STOCK HUSBANDRY	273-296
XIII.—OSTRICH-FARMING	297-305
XIV.—SHEEP-FARMING AND WOOL-GROWING	306-322
XV.—THE DIAMOND MINES OF SOUTH AFRICA	323-356
XVI.—THE COLONY OF NATAL	357-373
XVII.—TEA INDUSTRY IN NATAL	374-376
XVIII.—SUGAR INDUSTRY IN NATAL	377-390
XIX.—NATIVE RACES AND TERRITORIES	391-400
XX.—PONDOLAND	401-404
XXI.—ZULULAND, AMATONGALAND, AND SWAZILAND	405-410
XXII.—BASUTOLAND: THE SWITZERLAND OF SOUTH AFRICA ..	411-422
XXIII.—BRITISH BECHUANALAND AND BECHUANA PROTECTORATE	423-429
XXIV.—MASHONALAND AND THE BRITISH SOUTH AFRICA COMPANY'S TERRITORIES	430-440
XXV.—THE ORANGE FREE STATE	441-460
XXVI.—THE SOUTH AFRICAN REPUBLIC	461-490
XXVII.—GOLD-MINING AT WITWATERSRAND	491-512
XXVIII.—THE COAL FIELDS	513-518
XXIX.—THE SILVER MINES	519-526
XXX.—THE PORTUGUESE POSSESSIONS	527-529
XXXI.—THE GERMAN PROTECTORATE IN NAMAQUA-DAMARALAND	530-535
XXXII.—SOUTH AFRICA—ITS CLIMATE AND HEALTH RESORTS ..	536-565
STATISTICS OF COLONIES, STATES, AND TERRITORIES ..	566

MAP AND FULL-PAGE ILLUSTRATIONS.

	PAGE
MAP OF SOUTH AFRICA, SHOWING ITS POLITICAL DIVISIONS ..	<i>Frontispiece</i>
CAPE TOWN AND TABLE BAY IN 1893 (J. T. Pocock) ..	1
THE HILL, CLAREMONT (Jarman)	3
PONTOON ON THE VAAL RIVER (Trimm)	12
BLAAUWKRANTZ RIVER AND FOREST	18
GRAHAM'S TOWN	20
ST. JOHN'S GATES, LOOKING SEAWARD (Kisch)	22
VICTORIA FALLS, ZAMBESI RIVER (W. Ellerton Fry)	30
GIANT YELLOWWOOD TREE (Tudhope)	124
CAPE TOWN AND TABLE BAY IN 1714 (From an old print)	153
GOVERNMENT HOUSE, FROM THE OAK AVENUE, CAPE TOWN	203
GRAVE STREET APPROACH TO GOVERNMENT HOUSE (A. J. Fuller) ..	233
BARKLY WEST, VAAL RIVER DIGGINGS (Trimm)	323
THE ROADWAYS, KIMBERLEY MINE, 1872	329
THE KIMBERLEY MINE, WITH COBWEB OF WIRE ROPES IN 1873 ..	331
KIMBERLEY MINE UNDER REEF IN 1886	333
SECTION OF KIMBERLEY MINE	344
SORTING GRAVEL AT WALDEK'S PLANT, VAAL RIVER	354
COOLIES CUTTING THE SUGAR-CANE (Carey)	380
BLOEMFONTEIN	441
FARM NEAR MAGALIESBERG RANGE (H. F. Gros)	461
JOHANNESBURG: ECKSTEIN'S BUILDINGS, 14TH JULY, 1892 (Duffus) ..	474
PRETORIA: THE GOVERNMENT BUILDINGS	480
GEOLOGICAL CHART OF THE WITWATERSRAND BASIN	491
ROBINSON COMPANY'S BATTERY	503

ILLUSTRATIONS IN TEXT.

	PAGE
CONSTANTIA VALE	(S. B. Barnard) .. 4
SIMON'S TOWN	(S. B. Barnard) .. 6
STELLENBOSCH	(S. B. Barnard) .. 7
SIGNAL POST ON THE PLAINS	(Isaac Meiring) .. 11
DAM ON CRANMERE ESTATE .. .. .	.. .. 13
WATERFALL ON ORANGE RIVER	(Farini) .. 15
PORT ELIZABETH FROM THE HILL	(Green) .. 20
GATES OF ST. JOHN .. .. .	.. .. 22
MALETSUNYANE FALLS	(Dr. Greathead) .. 25
PIONEER'S CREEK, MOODIE'S GOLDFIELDS	(H. F. Gros) .. 26
TIGER CREEK, LEYDENBERG	(H. F. Gros) .. 27
PARIASAURUS BAINII .. .. .	.. .. 43
SNEEZEWOOD IN THE PERIE FOREST	(Tudhope) .. 133
SILVER TREE ON SLOPES OF TABLE MOUNTAIN	(A. H. Allis) .. 134
COMMANDER VAN RIEBEEK	(Morris) .. 141
THE OLD CASTLE GATE, CAPE TOWN	(Pocock) .. 148
LORD C. SOMERSET .. .. .	.. .. 169
SIR ANDRIES STOCKENSTROM .. .. .	.. .. 181
ANTI-CONVICT MEETING ON THE PARADE, CAPE TOWN .. .. .	.. .. 183
MR. JOHN FAIRBAIRN .. .. .	.. .. 184
SIR C. J. BRAND .. .. .	.. .. 185
GCALEKA CHIEF, KRELI .. .. .	.. .. 186
SIR GEORGE GREY .. .. .	.. .. 187
MR. SAUL SOLOMON .. .. .	.. .. 188
MR. WILLIAM PORTER .. .. .	.. .. 188
SIR J. C. MOLTENO .. .. .	.. .. 190
SIR H. B. E. FRERE .. .. .	.. .. 192
CETTYWAYO .. .. .	.. .. 194
SIR H. B. LOCH	(S. B. Barnard) .. 203
PARLIAMENT HOUSES	(A. H. Allis) .. 207
THE PUBLIC LIBRARY .. .. .	.. .. 214
OLD CRADOCK'S KLOOF	(Col. Michell) .. 217
BRIDGE OVER RIVER AT NORVAL'S PONT	(J. F. Harrison) .. 222
ENTRANCE TO HEX RIVER VALLEY	(I. Meiring) .. 222
SNOW-CAPPED PEAKS	(I. Meiring) .. 223
MATJESFONTEIN	(Logan) .. 224
NEW POST AND TELEGRAPH OFFICES .. .. .	.. .. 226

	PAGE
PRINCE ALFRED DOCKS	(S. B. Barnard) .. 228
THE LANDING JETTY, PORT ELIZABETH	(Harris) .. 229
MAIN STREET, PORT ELIZABETH	(Harris) .. 230
BUFFALO RIVER, EAST LONDON	(Stacey & Son) .. 231
ADDERLEY STREET, CAPE TOWN	(S. B. Barnard) .. 238
NEW THEATRE, DARLING STREET .. .. .	.. .. 239
ST. GEORGE'S STREET, CAPE TOWN	(S. B. Barnard) .. 240
OHLSOON'S BREWERIES, NEWLANDS .. .. .	.. .. 256
KLEINE SCHUUR VINEYARD, RONDEBOSCH .. .. .	.. .. 268
WINE CELLARS, GROOT CONSTANTIA .. .. .	.. .. 272
GROUP OF OSTRICHES	(Green) .. 297
OSTRICH INCUBATION	(Green) .. 303
AN OSTRICH NEST	(Green) .. 303
428½-CARAT DIAMOND .. .. .	.. .. 346
DE BEERS COMPOUND, KIMBERLEY .. .. .	.. .. 348
SIR C. B. MITCHELL .. .. .	.. .. 363
WEST STREET, DURBAN .. .. .	.. .. 366
TOWN HALL, DURBAN .. .. .	.. .. 367
CHURCH STREET, PIETERMARITZBURG	(G. Ferneyhough) .. 368
LEGISLATIVE COUNCIL BUILDINGS	(G. Ferneyhough) .. 369
ZULU WAR MEMORIAL	(G. Ferneyhough) .. 373
MOUNT EDGECOMBE SUGAR FACTORY .. .. .	.. .. 383
TITUS, A CAPE BUSHMAN	(Shoyer) .. 393
CAPE BUSHMAN ARMED	(Shoyer) .. 394
AMA-KHOSA KAFIR .. .. .	.. .. 396
MIXED RACES .. .. .	.. .. 399
LOVEDALE MISSIONARY INDUSTRIAL INSTITUTION .. .. .	.. .. 400
THE BASUTO CHIEF MOSHESH .. .. .	.. .. 414
PRESIDENT REITZ	(S. B. Barnard) .. 445
PRESIDENT BRAND .. .. .	.. .. 446
WILD GAME ON THE PRAIRIES .. .. .	.. .. 450
HILLANDALE, NEAR BLOEMFONTEIN	(R. E. Brounger) .. 455
JAGERSFONTEIN DIAMOND MINE	(Harvey) .. 457
POST AND TELEGRAPH OFFICES .. .. .	.. .. 458
DUTCH REFORMED CHURCH, BLOEMFONTEIN	(R. E. Brounger) .. 459
PRESIDENT BURGERS .. .. .	.. .. 463
THE HIGHVELD BEFORE THE DISCOVERY OF GOLD	(Oates) .. 472
RISSIK STREET, JOHANNESBURG	(Duffus Bros.) .. 476
CHURCH SQUARE, PRETORIA	(Perrin) .. 481
CROCODILE RIVER VALLEY, LOOKING EASTWARD .. .. .	.. .. 483
PRESIDENT KRUGER	(Duffus Bros.) .. 485
THE FERREIRA AND ROBINSON MINES .. .. .	.. .. 496
BOTTOM OF A SHAFT .. .. .	.. .. 499
ROBINSON CHLORINATION WORKS .. .. .	.. .. 506
BRAKPAN COLLIERY .. .. .	.. .. 518
TRANSVAAL SILVER MINES .. .. .	.. .. 523

INDEX TO CHAPTERS.

CHAPTER I.

SOUTH AFRICA: ITS POLITICAL DIVISIONS AND PHYSICAL FEATURES.

South Africa as a Field for Colonisation—Divisions, Area, and Population—Cape Peninsula—Constantia—Simon's Bay and Cape Point—Stellenbosch—Paarl—Bain's and Mitchell's Passes—Ladismith and Oudtshoorn—the Karroo—Rivers and their Characteristics—Bushmanland—Orange River Waterfalls—Namaqualand and Damaraland—Kalahari Desert—George and Knysna—Fish River Bush—Eastern Districts—Graham's Town and Port Elizabeth—Transkeian Territories—St. John's River—Natal Coast Lands—Mont aux Sources, the "Great Divide"—Basutoland Waterfall—The Kaap Valley and Leydenberg—Tolo Azime Falls on the Limpopo—Mashonaland—Victoria Falls of the Zambesi 1-31

CHAPTER II.

GEOLOGY, FOSSILS, AND MINERALS OF SOUTH AFRICA.

Work of Early Observers—Palæozoic Formation—Sandstones of the Devonian Period—Dwyka, or Trap Conglomerate—The Karroo Beds—Diamond-bearing Pipes of Kimberley—Boring Operations—Jurassic and Cretaceous Divisions—Denuding Agencies—Volcanic Activity—Limestone Caverns—Palæontology—Fossil Fauna—Minerals—Gold, Coal, Copper, Silver, and Lead, Cinnabar, Iron, Manganese, Antimony, Cobalt, Tin—Earthy and Saline Minerals—Nitre Deposits—Limestones—Marble and Building Stones—Mineral Springs—Geological and Mineralogical Specimens .. 32-49

CHAPTER III.

VERTEBRATE FAUNA OF SOUTH AFRICA.

Vertebrate Fauna—Features of Animal Life—The Days of the Early Settlement—Naturalists and Explorers—Mammalia—Birds—Reptiles—Amphibians—Fishes—Protection of Game 50-90

CHAPTER IV.

FLORA OF SOUTH AFRICA.

Richness of Forms—South-western Region—Tropical Region—The Karroo Region—Composite Region—Kalahari Region—European Plants .. 91-123

CHAPTER V.

WOODS AND FORESTS.

Naturalised Species in the Cape Peninsula—Government Plantations—Australian
Wattle Barks—Timber Forests—The Knysna-Forest Management—Sleeper
Industry—Woods of the Forest—Yellow-wood—Stinkwood or Laurel—
Sneezewood—Wagon Woods—Silver Tree—Scrub Forest—Forest Depart-
ment 124-137

CHAPTER VI.

DISCOVERY AND EARLY OCCUPATION OF THE CAPE BY EUROPEANS.

Tradition of Phœnician Exploration—Diaz's Discovery of the Cape—Vasco da
Gama's Voyage—Van Riebeeck's Expedition—Experiences of the first
Europeans in Table Valley—The Aboriginal Races—Relations with the
Hottentots—Free Burghers Settled as Colonists—First Colonial War—
Decimation of the Hottentots by Small-pox—Governor Van der Stell's
Rule—Arrival of Huguenot Refugees—The French Language Suppressed—
Troubles between the Colonists and Governor Van der Stell—Arbitrary
System of Government—Dispersion of the Population—Collision with
Bushmen and Kafirs—Attempted British Conquest of the Cape in 1781—
Efforts of Colonists to Secure Freedom of Trade—Rebellion at Graaff-Reinet
and Swellendam—Seizure of the Cape by English Forces—Disturbances in
the Inland Districts—the Cape Restored to Holland—Reforms in Govern-
ment—Final Cession of the Cape to Great Britain. .. . 138-166

CHAPTER VII.

BRITISH RULE DURING THE CENTURY.

British Administration—Expulsion of Kafirs from the Colony—The Kafir
Attack on Graham's Town—Arrival of British Settlers in 1820—Lord
Charles Somerset's Government—Anglicising the Colony—The Magna
Charta of the Aborigines—The Slave Emancipation Act—The War of 1834
—Sanguinary Reign of Chaka—Trek of the Emigrant Boers—Treachery of
Dingaan—Death of P. Retief—Defeat of Dingaan and the Zulus—Occu-
pation of Natal, and Hostilities—Natal declared a British Colony—Orange
River Sovereignty—The Sand River Convention—Abandonment of the
Sovereignty—The Glenelg Policy—Stockenström Treaties—The Anti-Con-
vict Agitation—Grant of Representative Government—Sir George Grey's
Native Policy—The Kafir Cattle-killing Delusion—Annexation of British
Kaffraria—The Diamond Fields Discovered—Responsible Government Intro-
duced—Lord Carnarvon's Confederation Proposals—Annexation of the
Transvaal—Sir Bartle Frere's Government—Native Disturbances—The
Zulu War—Restoration of Cetywayo—The New Republic in Zululand—
Zululand made British Territory—The Basuto Disarmament War—
Treachery of Umhlonblo—Transvaal Deputations—The War of Indepen-
dence—Majuba Hill and Peace Negotiations—The Transvaal Suzerainty—

The London Convention of 1884—Trade Route to the North—Freebooters in Bechuanaland—Bechuanaland Protectorate—Sir C. Warren's Expedition—British Sovereignty over British Bechuanaland—Matabeleland, Mashonaland, and Zambesia 167-202

CHAPTER VIII.

THE CAPE GOVERNMENT, INSTITUTIONS, ROADS, RAILWAYS, AND HARBOURS.

Governor and Parliament—The Ministry or Cabinet—List of Ministers—Parliament Houses and the Parliament—The Franchise and Ballot—Courts of Law—Registry and Transfer of Landed Property—The Administration of Estates—Educational System—Colonial Defence—Public Libraries—Museums and Royal Observatory—Hospitals, Asylums, and Leper Institutions—Thrift and Providence of the People—Recreations and Sports—Mountain Passes, Roads, and Bridges—Beginning and Extension of Railways—Customs Conference and Customs Union—Orange Free State Railways—Train Service to Kimberley and Johannesburg—Main and Connecting Lines—Engineering Features and Highest Altitudes—Norval's Pont Bridge—Hex River Pass—Matjesfontein—Railway Workshops—Colonial Coal—Outlay and Earnings on Railways—Private Lines of Railway—Postal System and Ocean Mail Service—Telegraph Lines—Harbours—Table Bay Docks—Algoa Bay and Port Elizabeth—Buffalo River and East London—Lighthouses 203-232

CHAPTER IX.

POPULATION, METROPOLIS, COMMERCE, FINANCES, BANKING, AND INDUSTRIES.

Population—Races—Occupations—Conjugal Conditions—Religious Denominations—Cape Town, the Metropolis—Adderley Street—St. George's Street—Government House—The Gardens—Mayor and Town Council—City Improvements—Other Chief Towns—Commerce—Revenue and Expenditure—Expenditure Chargeable to Loan Acts—Public Debt—Appropriation of Public Debt—Railway Construction—Banking Business—Colonial Industries—Fisheries 233-258

CHAPTER X.

LAND AND AGRICULTURAL PRODUCTIONS.

Land Laws—Value of Land—Agricultural Department—Production—Wheat-growing in the West and in the Eastern Coast Districts—Fruit-growing 259-266

CHAPTER XI.

VITICULTURE.

Introduction of the Vine—Number of Vine-stocks—Output of Wines and Spirits—Principal Wine Districts—Production of Cape Vineyards—Phylloxera 267-272

CHAPTER XII.

LIVE STOCK HUSBANDRY.

The Cape Horse and Horse-breeding—Mules—Asses—Cattle, Pure-bred Afri-
kander and Imported—Dairy-farming and Travelling Dairies—The Cape
Goat—The Angora Goat 273-296

CHAPTER XIII.

OSTRICH FARMING.

Domestication and Farming of the Ostrich—Wild Birds—Artificial Hatching—
Export and Value of Ostrich Feathers—Census of the Ostrich-rearing
Districts—Visit to an Ostrich Farm in the Cape Colony .. . 297-305

CHAPTER XIV.

SHEEP-FARMING AND WOOL-GROWING.

Growth of the Wool Manufacture—Introduction of Merino Sheep at the Cape—
Distribution of Sheep in the Colony—Coast Districts—Karoo Sheep-walks
—Different Breeds of Sheep—Values of Wool—Wool-washeries—Wool
Seasons—Character of Cape Wools 306-322

CHAPTER XV.

THE DIAMOND MINES OF SOUTH AFRICA.

Discovery of the First Diamond—Early Days on the Fields—The Diamondiferous
Area—The Town of Kimberley—Occurrence of the Diamonds—The Road-
ways in Kimberley Mine—Reef Difficulties—De Beers Mine—Dutoitspan
and Bultfontein—Formation of Companies—Amalgamation—The De Beers
Company and its Operations—The Diamond-bearing Pipe of the Kimberley
Mine—Present Mode of Winning the Diamonds—The Largest Stone Found
—The Native Compounds—Kenilworth Village—Dutoitspan and Bult-
fontein Companies—The Premier (Wesselton) Mine—Jagersfontein and
Koffyfontein Mines—The River Diggings—Production of Diamonds
323-356

CHAPTER XVI.

THE COLONY OF NATAL.

Early History—Native Policy—Byrne's Immigration—Representative Institu-
tions—Langalibalele Disturbance—Revenue and Commerce—Area and
Population—Present Government—Institutions—Port Natal—Town of
Durban—City of Maritzburg—Agricultural and Pastoral Capabilities—
Lands and their Value—Coalfields—Railways—Zulu War Memorial
357-373

CHAPTER XVII.

TEA INDUSTRY IN NATAL.

Beginning of the Industry—Cultivation and Manufacture—Grades of Quality and Acreage Planted 374-376

CHAPTER XVIII.

SUGAR INDUSTRY IN NATAL.

First Crop Raised—Slow Growth of the Industry—The Labour Difficulty—Native Kafir Mills—Development—Mount Edgecombe Factory—Production to Date—Present Position—Prospects of the Industry—Customs Union 377-390

CHAPTER XIX.

NATIVE RACES AND TERRITORIES.

Primitive Races—Hottentots and Bushmen—Structure of their Language—Present Type of Bushmen—The Kafir and Bantu Races—Traits of Character—Progress in Civilisation—Mixed Races—Government of the Kafir Tribes—Missions—Lovedale Industrial Institution 391-400

CHAPTER XX.

PONDOLAND.

History—Protectorate of the Coast—Agreement with Umquikela—Condition of Pondoland—Smelling-out and Witchcraft 401-404

CHAPTER XXI.

ZULULAND, AMATONGALAND AND SWAZILAND.

ZULULAND declared British Territory—Physical Features, Area, Population—Revenue—Government—Districts—Cattle raising and Agriculture—Missions—Occupation by Europeans only for Mission, Trading or Mining Purposes—Gold and other Minerals. AMATONGALAND—Area and Population—Character of the Country—Its Productions—Kosi River Mouth. SWAZILAND—Population—Area—Features—The late King Umbandine—Concession Granting—Various Forms of Concessions—Joint Commission—Provisional Government—Convention of 1890 with the South African Republic—Negotiations for Future Government 405-410

CHAPTER XXII.

BASUTOLAND, THE SWITZERLAND OF SOUTH AFRICA.

Physical Aspects—Mineral Wealth—Game on the Drakensberg—Last of the Bushmen—Live Stock—Basuto Ponies—Agriculture—Trade and Capabilities—Census—Revenue—Educational Agencies—Witchcraft abolished—History

of Moshesh and the Tribe—Cannibalism—The French Missionaries—Territorial Disputes—Fighting at Viervoet—Battle of Berea Mountain—Moshesh's Submission—Wars with the Free State—Saved by the British Government—Annexed to Cape Colony—Disarmament Proclamation—War of 1880—Imperial Control Resumed—Land Law Communal—Taxes—Mode of Life—Government 411-422

CHAPTER XXIII.

BRITISH BECHUANALAND AND BECHUANA PROTECTORATE.

The Bechuana People—Early Missionaries—Pretorious' Proclamation of 1868 extending the South African Republic to Lake Ngami—London Convention of 1884—Cape Trade Route to the Interior—Government and Revenue—Suitability for Cattle-ranching—Agricultural Production—Rainfall—Water-boring and Well-sinking—Lands and their Value—The Protectorate—The Kalahari Desert 423-429

CHAPTER XXIV.

MASHONALAND AND THE BRITISH SOUTH AFRICA COMPANY'S TERRITORIES.

Expansion of British Sphere—Treaty with the Matabele Chief, Lobengula—The Rudd Concession—The British South Africa Company—The Pioneer Expedition—Character of the Country—Salisbury and other Townships—The Gold-bearing Area—Result of Crashings—The Beira Railway—Agricultural and Pastoral Prospects—Sphere of the British South Africa Company north of the Zambesi—The Imperial Commissioner in Nyassaland—The Zimbabwe Ruins—Their Sabæan or Phœnician Origin—Association with the Ancient Land of Ophir—Arabs and Portuguese on the East Coast—Free Navigation of the Zambesi 430-440

CHAPTER XXV.

THE ORANGE FREE STATE.

Aboriginal Occupants—The Griquas and Bergenaars—The Bechuana Boy—Boer Emigrants—British Sovereignty Proclaimed—Disturbances and Battle of Boomplaats—The Sovereignty Abandoned—Convention of Bloemfontein—Republic Established—The Constitution—Successive Presidents—Troubles with the Griquas—Wars with the Basutos—President Brand—The Diamond Fields Territory—Compensation by British Government—Progress of the State—Customs Union—Railway Lines—Area and Features of the Country—Census and Revenue—Government—Franchise—Education—Religion—Statute Law—The Commando and Liquor Laws of the State—Pastoral Resources—Agriculture—Ladybrand and the Conquered Territory—Minerals—Coal—Salt pans—Diamond Mines—Bloemfontein and its Institutions—The New Raadzaal—Resort for Invalids—Snow-storms—Towns and Villages—The Maroko District 441-460

CHAPTER XXVI.

THE SOUTH AFRICAN REPUBLIC.

Early History—Sand River Convention—President Burgers—Annexation and Retrocession—Physical Aspect—Population—Land : its Value and Capabilities—Gold Discovery—The Sheba Mine—The Kaap Fields—The “Banket” at Witwatersrand—The Centenary Record—Johannesburg—Deep Level Mining—Future of the Industry—Outlying Fields—Pretoria—Railways—The Delagoa Bay Line—Revenue and Expenditure—Commerce—The Grondwet, or Constitution—The President and Executive—The First and Second Raad—The Franchise—Naturalisation—Judicial System—Public Education—Concessions—The Pretoria Mint—Unification of Coinage
461-490

CHAPTER XXVII.

GOLD-MINING AT WITWATERSRAND.

The “Banket,” or Conglomerate Formation—Geological Chart—The Rand Basin—The Main Reef Series—The Inner Series of Reefs—The Early Workings—Output of Gold from the Rand—Active Workings—Reef Occurrences—Deep Levels—Development and Mine Equipment—Milling—Concentration—Chlorination—Tailings and their Treatments—Cyanide Process—Molloy Process—Results of Gold Extraction—Cyanide Losses—Cost of Mining and Milling—Machinery, Labour, &c. 491-512

CHAPTER XXVIII.

THE COAL FIELDS.

The Coal Measures of the South African Republic—The Vereeniging Collieries—Brakpan Colliery—Method of Mining 513-518

CHAPTER XXIX.

THE SILVER MINES.

Smelting Industry—Experiments in the Manufacture of Coke—Discovery of Silver Ores—Albert Mine—Concentration Works—The Willows and Other Properties—The Transvaal Silver Mine—Reduction Works—Concentrating Machinery—Other Properties 519-526

CHAPTER XXX.

THE PORTUGUESE POSSESSIONS.

Estado d’Africa Oriental—Provinces of Mozambique and Lorenzo Marques—Area and Population and Trade—Quillimane—Chinde River Mouth—Transit Dues Across Portuguese Territory—Senna and Tete Coal Beds—Agriculture, Sugar-cane, Coffee, and Fruits—Concessions to Companies—Beira Pioneer Railway, and Port Beira—Sofala, Chilokane, and Inhambane—Pearl Fisheries—Lorenzo Marques and Delagoa Bay—Population—Trade—Climate—Steam Communication 527-529

CHAPTER XXXI.

THE GERMAN PROTECTORATE IN NAMAQUA-DAMARALAND.

Early Relation of Cape Colony with West Coast Territory—Herero Application for British Protection—Walwich Bay Annexed—Mr. Palgrave's Mission—Sir Bartle Frere's Recommendations—Extension Disapproved of by Imperial Authorities—Annexation by Germany—Boundary of the German Protectorate—Area and Population—Hottentots, Bushmen, Damaras, Hill Damaras, Tribes of Ovamboland—Physical Features—Climate—Geology and Minerals—Trade—German and English Developing Companies—Walwich Bay 530-535

CHAPTER XXXII.

SOUTH AFRICA—ITS CLIMATE AND HEALTH RESORTS.

Suitability of the Climate for Europeans—The Seasons—The Coast Climate—The Climate of the Karroo—The Climate of the Interior Plateau—The Climate of the Transvaal—The Climate of the Mountain Regions—The Climate of the Natal Highlands—General Remarks for Invalids.. 536-565

STATISTICS OF COLONIES, STATES, AND TERRITORIES 566

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ILLUSTRATED OFFICIAL HANDBOOK OF THE CAPE AND SOUTH AFRICA.

CHAPTER I.

SOUTH AFRICA: ITS POLITICAL DIVISIONS AND PHYSICAL FEATURES.

SOUTH AFRICA is daily growing into prominence and awakening wide interest. Although long-neglected and comparatively ignored as a field for settlement, it is now being universally recognised as a country possessed of great and varied resources, giving bright promise for the future.

It has a most healthful climate, where cloudless skies, continuous sunshine, and dry air can be enjoyed to perfection. Its lands give scope for every kind of pastoral and agricultural occupation. Flocks of sheep, herds of cattle, and troops of horses feed entirely on its natural plants and grasses. Its soils are fertile, offering the most ample choice to the cultivator, and producing almost anything and everything grown in tropical or in temperate latitudes. Its mineral deposits are varied and abundant, and some seem well-nigh inexhaustible. Its flora is one of the richest on the earth's surface. Its fauna embraces the most interesting and conspicuous forms of the animal kingdom, and its inland regions are still the sportsman's paradise. It has settled European communities, some of whom have for successive generations been engaged in the pioneering work of colonization; and within its borders are native populations amenable to civilizing influences, and capable of becoming an increasingly important and valuable industrial element.

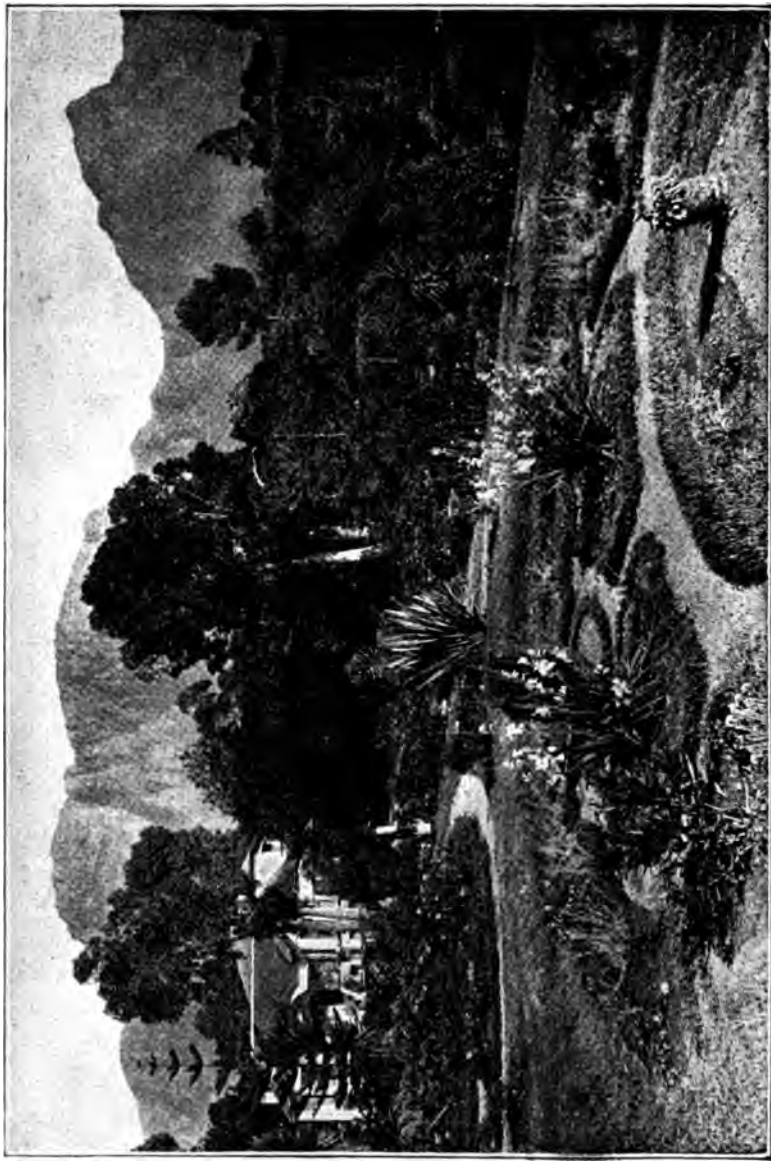
Its external trade and commerce, as represented by the imports and exports at the British colonial ports of the Cape and Natal, amount to twenty-six and a half millions sterling per annum. Its developed productions and exports comprise corn,

wine, and wool ; sugar, coffee, tea, rice, and all kinds of fruits ; horses, cattle, sheep, and goats ; mohair, ostrich feathers, ivory, horns, and hides ; diamonds, coal, and timber ; gold, silver, copper, iron, lead, manganese and numerous other mineral substances. And now that means of intercommunication have been multiplied, and railways are penetrating from its various seaports to its rich interior, it is impossible to forecast the possibilities of industrial growth and expansion which are as yet dormant.

Under the title of "South Africa" is embraced the country stretching from the extremity of the continent at Cape L'Agulhas in 34° 50' S. lat., northward into the Tropics, having as its boundary a line stretching from west to east, in about S. lat. 16°, above the Cunene and the great Zambesi Rivers. Strictly speaking, the lands which lie further to the north, extending over Barotseland to the borders of the Congo Territory, and over Nyassaland to the limits of German East Africa, between Lake Tanganyika and Lake Nyassa, should be also included, as they are within the sphere of British influence and the administration of the British South Africa Company. But taking the territories from the Cape to the Zambesi as the limit for the purposes of this work, they embrace an approximate area of one and a quarter million square miles, considerably exceeding the size of British India. Their population, including the native races and persons of all shades of colour, is estimated at over four and a quarter millions ; and of these, the Europeans, or persons of European descent, number about six hundred and sixty-eight thousand.

Politically, the country contains several divisions. The southern and most populous portion is the Cape Colony, which, together with the islands on its western coast, and Natal, Zululand, Basutoland, British Bechuanaland, the Protectorate of Bechuanaland, and the Chartered Company's territory in Mashonaland, Zambesia, and Nyassaland, form the British Possessions. There are two independent republican states, namely, the Orange Free State and the South African Republic. There are several quasi-independent native territories, such as Pondoland, Swaziland, Amatongaland, Matabeleland, and Ngamiland. The Portuguese Possessions, including Gazaland, stretch, on the east coast, from Delagoa Bay to Mozambique. And, on the west coast, north of the Orange River, are the territories of Great Namaqualand and Damaraland, under the acknowledged Protectorate of Germany.

Although South Africa everywhere bears a peculiar impress characteristic of itself, it has much variety of surface and scenery ; and anyone travelling over its southern coast valleys, its central tablelands or inland plains, its north-western desert tracts, or its



THE HILL, CLAREMONT (PROPERTY OF H. M. ARDERN, ESQ.).

[To face page 3.]

semi-tropical eastern slopes, will realise that each locality has marked physical features differing from the other.

The Cape Peninsula, which is usually the first portion of Southern Africa the voyager from England becomes acquainted with, gives a good impression of the characteristic boldness and grandeur of the mountain scenery. The peninsula is, for the most part, a mountain ridge extending for thirty miles from Table Bay on the north, to its extremity, along the spacious indenture of False Bay, on the south-east. The whole of the range rises abruptly from the seaward side, in a bare imposing mass, with a dozen headlands jutting out, forming what are known as the Twelve Apostles. On the eastern side the rocky escarpments are relieved by dense vegetation in the "kloofs" or ravines, and at their base are spread a succession of plantations and woods sheltering the numerous villas and mansions of suburban residents. The range terminates on the north with the titanic wall of rock, named the Table Mountain, rising almost perpendicularly to a height of 3,582 feet, facing Table Bay. It is flanked on the left by the picturesque Devil's Peak—the "Windberg" of old navigators—and on the right by the Lion's Head, which slopes away to the round-backed hill known as the Rump, or Signal Station. In the amphitheatre formed by these elevations is spread out the city of Cape Town.

There are numerous eminences of similar tabular form throughout the country, but it is an aphorism among Afrianders, or Cape-born colonists, that "there is but one Table Mountain." The views along its plateau, slopes, and kloofs, present a microcosm of all that is best in South African scenery; and this, together with the advantage of proximity to the capital, a pleasant climate, and the enjoyment of all the comforts and conveniences of life, have made its environs attractive and favourite places of residence.

A railway service from Sea Point to Simon's Town gives facilities for travel from one end of the peninsula to the other; but there are many beautiful drives and walks in every direction. A favourite one is that from Cape Town, over the Kloof, to Camp's Bay and Sea Point. The road winds up from the city to the neck of the Kloof, between the western side of Table Mountain and the peaked Lion's Head, with lovely views landward and seaward, the one embracing the city and the circling shores of Table Bay, the softly-rounded Tygerberg Hills, and the serrated summits of the distant Drakenstein Range; while on the other, there are steep rocky cliffs, a mingling of bush and foliage, and the changing and shifting lights of the boundless ocean.

Another enjoyable drive is that round the Victoria Road, by way of Sea Point to Hout's Bay, Constantia, and Wynberg, com-

pleting the circuit of Table Mountain. It commands as fine a combination of scenery as is to be found in any part of the world. Portion of the road winds along the precipitous slopes on the mountain side, overlooking the rocky seashore, washed by the blue waters of the Atlantic, and reminding one of the picturesque loveliness of the Cornice Road along the Riviera. Then it ascends to the ridge, where the Hout's Bay and valley open out, like a Scottish loch and glen. The beach is the goal of picnicing tourists; but there are many spots affording welcome shade from the blazing sun, where the eye is refreshed with running waters, the cool green of surrounding vineyards, and the wooded gorges and kloofs at the back of Table Mountain. On leaving the valley and reaching the Hout's Bay Nek there is a pleasing panoramic view overlooking the vale of Constantia,



CONSTANTIA VALE.

Wynberg, Claremont, and the wide-stretching Flats, with the white sandhills along the shores of False Bay at Muizenberg. Beautiful plantations of the silver-tree occur extensively on the hill-sides, their glossy leaves, when stirred by the wind, flashing and glistening in the sun, and picturesquely contrasting with the sombre pines, chestnuts, and oak trees bordering the road. The famous Constantia vineyards here invite a passing visit, especially in the vintage season, when the grape harvest is being gathered, and the wine-presses overflow with the luscious juice, which in former times was wont to soften the temper of Ministers and sweeten the lips of Royalty itself.* Soon after, the Military

* The Dutch East India Company had an agreement with the proprietors of the Constantia wine-farms for a yearly supply of their choicest vintage, and this was continued for some time after the cession of the Cape. A portion of the supply was sent to England, where it was given away to high officers of State, and Royalty itself. It is related that Sheridan was dining with Lord Chancellor Thurlow, on an

Camp on Wynberg Hill is passed, and the village of Wynberg is reached, with its shaded streets, and handsome residences, surrounded on all sides by enchanting scenery. From there to Cape Town, the road continues through Claremont, Newlands, Rondebosch, and Mowbray, half hid beneath magnificent avenues of oaks and pines.

Near the extremity of the Peninsula is the harbour of Simon's Bay, the chief station and depôt of the Royal Navy on the South African Coast. The bay is well sheltered, and affords secure anchorage to the largest vessels afloat within a comparatively short distance of the shore. On the hills above, fortifications have lately been erected, with heavy armament, rendering the place well-nigh impregnable against attack by sea. The Naval Yard, adjoining the Admiralty House, and covering a large portion of the fore-shore, is an extensive establishment, provided with stores, machinery, and every appliance for equipping and repairing modern war-ships. In the precincts of Simon's Town, and at Kalk Bay, and other inlets along the shore of False Bay, are several favourite watering-places, which are the resort of business men from the metropolis, as well as from Kimberley and Johannesburg, throughout the summer season.

A few miles beyond Simon's Town is the real "Cape of Good Hope," which the Portuguese poet Camoens celebrates in his *Lusiad* as the "southern point of Afric's coast," although geographically the low shelving bank of L'Agulhas is the actual extremity of the continent. Cape Point, as it is locally termed, is a precipitous sandstone cliff, on which a lighthouse is erected, showing a revolving catoptric light of the first order, visible at a distance of thirty-six miles. The view from this headland is very grand, overlooking the foaming breakers nearly nine hundred feet below, and taking in the waters of False Bay and the great wide expanse of the South Atlantic.

"Here the white surge comes bounding to the shore,
And the cliff answers to its angry roar,
For where the Cape of Storms heaves high its steep,
The clear south-easter foams along the deep,—
Whirls the wild spray in gusts of driving snow,
And sweeps with its salt shower the reeling prow;
While round each winding bay and jutting rock,
The glassy swell rolls with its thunder shock;
Or, deepening vast and sullen, heaves away
To the lone isles beneath descending day."

occasion when some of this wine was produced, which tickled the palate of the connoisseur so much that he set his wits to work to get more of it. The Chancellor, however, was not easily induced to produce his Constantia in such profusion, and Sheridan turned to a gentleman sitting further down, and said, "Pass up that decanter, for since we cannot double the Cape, I must return to Madeira."

At the southern end of the Colony, the coast has a general trend from the south-east to the north-west ; and parallel with it the land gradually rises in successive ridges, with intervening valleys, to the elevated terrace forming the boundary of the Karoo. This seaboard region, extending at distances varying from twenty to one hundred and twenty miles from the coast, is rich in varied scenery, with bold hill ranges and charming fertile valleys, whilst scattered over it are numerous attractive towns and villages. Along the foot spurs of the first line of mountains, collectively named the Drakenstein Range, are the



SIMON'S TOWN.

vine-growing valleys of Hottentots Holland, Stellenbosch, Paarl, Franschhoek, Wellington, Twenty-four River, and Oliphant's River ; and, extending from them to the seaboard, are extensive undulating arable lands, forming the great grain-producing districts of Koeberg, Darling, Saldanah Bay, Malmesbury, Piquetberg, and Clanwilliam. Nothing in South Africa surpasses this portion of the country for tillage and wealth of cultivation. Throughout the harvest season, for fifty or sixty miles on a stretch in every direction, the eye rests on a succession of corn-fields, waving in the brilliant sunshine, and interspersed amongst

them, dotted over the plains, or perched on the tops of the rounded hills, are the comfortable-looking, whitewashed homesteads of the corn-farmers. The old towns, such as Stellenbosch and the Paarl, are singularly quaint and interesting. Their existence dates backward for nearly two centuries, and they still retain the characteristics of the old Dutch and French settlers who built them.

Stellenbosch is prettily situated on a plain watered by the Eerste River, and embosomed in an amphitheatre of hills and mountains. The streets are at right-angles to each other, and



STELLENBOSCH.

precisely alike in appearance, shaded by venerable oaks, and lined on either side with detached old-fashioned gable-faced houses, having "stoeps" or raised terraces in front, and a background of garden, orchard, or vineyard. The place is suggestive of a quiet, rural elysium, where life is passed without hurry or apprehension. It has, of late years, become one of the chief educational centres of the country—its theological and arts colleges, and its schools and ladies' seminaries, attracting students from all parts of South Africa.

The Paarl is distant about fifteen miles, and situate at the foot

of the granite ridge whose enormous boulders, glistening like "pearls" in the sun, gave the place its name. The town forms one continuous street, stretching for several miles, the houses, wine stores, and factories, with their whitewashed fronts and gables shining out from under rows of old oaks and pine trees; and along the slopes of the hills and over the valley trim peach gardens, lemon and orange groves, and vineyards are thickly planted. The Berg River, which rises in the mountains above Franche Hoek, flows through the Drakenstein and Paarl Valley to St. Helena Bay, where it discharges itself into the Atlantic. It is a perennial stream, and one of the few colonial rivers navigable by small craft for some distance from its mouth.

The vale of Hottentots Holland, half enclosed by the mountains, and open to the cooling breezes of False Bay, is another pleasing spot, where marine enjoyments may be varied with rural pleasures among the picturesque well-wooded estates which are to be found there. One of these, named "Vergelegen," has some interesting historical associations: it was laid out at the end of the seventeenth century by the Dutch Governor Adrian Vander Stell, whose plantations of stately oak and camphor-wood trees still flourish.

Behind the high wall of the Drakenstein mountain range is the Tulbagh and Worcester valley, which can be reached either by rail, making a detour round Tulbagh Kloof, or by one of the Cape mountain roads known as "Bain's Pass," proceeding from the village of Wellington. This road ascends with many a curve and stretch for some seven or eight miles to the summit of the Drakenstein range, where it commands a most extensive and pleasing landscape, and then descends through a defile of rugged mountainous masses to the Breede River at Darling Bridge. All along this descent of the mountain the road has been blasted and scarped out of the hard quartzose sandstone—in some places being cut through massive buttresses, leaving gigantic gates, natural arches, and overhanging ledges; in others it is carried across abyss-like gaps, built up with precipitous retaining walls from 100 to 300 feet high. "Hills upon hills in quick succession rise" as you advance, and new objects of interest and admiration are ever presenting themselves. The rock scenery is singularly weird and fantastic—now rising high in majestic walls, then piled up in craggy pinnacles—here standing in gaunt spectral groups, or there strewn in broken and crumbled confusion. In many places its weather-worn character might convey a dreary impression, if it were not for the endless variety of light and shade arising from the winding course of the road, and the colours and forms of the vegetation fringing the sides of the mountains. There

is generally a rich display of characteristic Cape flora. Heaths of scarlet, purple, and other hues; bulbs of great variety; orchids, ferns, and several handsome shrubs and dwarf trees, alternate together with grasses, creepers, and soft mosses; and the stratified formation of the sandstone encloses many humid recesses whence issue rills and streams which keep these evergreen and fresh all the year round. The flowering season of September, however, is the time to see the Pass to advantage; after the rains there are countless sprays, cascades, and waterfalls, leaping from ledge and precipice, and rushing down to swell the dark tarn-like pools and roaring torrent of the Witte River at the bottom of the deep ravine.

Emerging from the Kloof at Darling Bridge, the flats forming the Tulbagh and Worcester valley are traversed, and then the Michell's Pass in Mostert's Hoek is reached. This is another mountain scene of great boldness and picturesque beauty. The Breede River, a clear wide stream, is bridged across at the entrance, and the road ascends along the left bank for a length of about six miles, the whole of it being scarped out of the rock, and strengthened by a retaining wall, from three to forty feet in height. The old road—little more than a cattle track—is still to be seen climbing over projecting krantzies, and then descending abruptly to the river bed, and fifty-year-old inhabitants delight to tell of their perilous adventures in crossing it years ago, when waggons and produce had to be carried over piecemeal, or on the back of oxen, and afterwards put together and re-arranged, when they had managed to scramble through. In this Kloof the mountains rise in wild picturesque confusion, the cliffs, peaks, and ranges seeming to topple in every direction from the arched and undulating stratification of the rocks, while the many grassy hollows and patches of flowering heaths and shrubs clothing their feet, give a verdant beauty to the scene. The charm of them, as of all South African mountains, is enhanced by the rich and wonderful colour effects of the morning and evening sunlight. In the full noonday glare they exhibit nothing but the rugged, grey, naked rock; but the scene is glorious when at sunrise the purple light of dawn gives place to magnificent flame-bursts of crimson and gold: or, again, before sunset, when they are overspread by beautiful ever-changing tints, from a rosy purple to vivid bronze intensifying the dark steel-blue shades cast by the craggy projections on their furrowed sides.

Reaching the summit of the pass, nearly 2,000 feet above the sea, the village of Ceres, a favourite health resort, and the district of Warm Bokkveld are seen stretched out below in a circular basin, bounded by the heights of the Cold Bokkveld, frequently

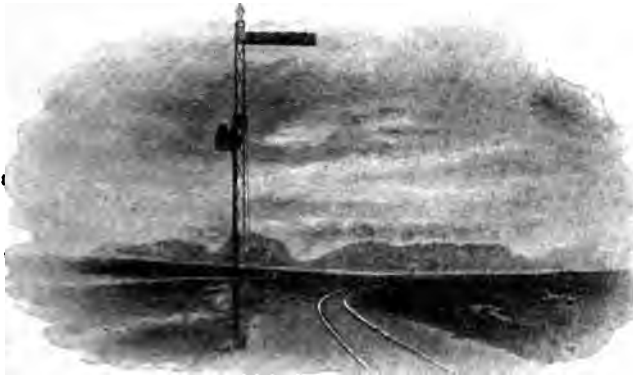
snow-capped in winter. Here is the watershed of the West—the mountains attaining their highest point (6840 feet) in the lofty peak of the Winterhoek. The drainage on one side gathers into the Oliphant's River, which empties itself into the Atlantic; and on the other side forms the Breede River, which winds its way through the districts of Worcester, Robertson, and Swellendam, and flows into the Indian Ocean.

Worcester, one of the prettiest country townships in South Africa, lies amidst pleasing picturesque scenery in the Breede River basin, which extends in a direct line from east to west about forty miles. An endless chain of high hills runs on each side of it, enclosing narrow fertile valleys, such as the Goudini, Hex River, Klaasvogel's River, Montagu, and the elevated slopes of the Keisi and the Koo, behind Robertson, where cherries and other European fruits grow to perfection. On the opposite side an opening through the Boschveld leads past the hamlet of Villiersdorp and the Moravian mission station of Genadendal to the valley of the River Zonder End and the districts of Caledon and Bredasdorp, rich in cornlands, vineyards, and sheep-walks. Further eastwards the Langebergen Range, furrowed with ravines and serrated with crags, bounds the maritime districts of Swellendam, Heidelberg, and Riversdale, where is the extreme limit of the climatic tract visited by the westerly winds and rain. Through a gap in these mountains the Gauritz River, carrying off the principal drainage of the southern Karoo, finds its way to the sea south of Mossel Bay.

Behind the rocky barrier of the Langebergen and Outeniqua Mountains is another group of valleys, forming the divisions of Ladismith, Oudtshoorn, and Uniondale. These are notable for their productiveness. Oudtshoorn especially is an important agriculture centre, celebrated for its prolific yield of grain, wine, brandy, dried fruits, vegetables, and tobacco, as well as for its luxuriant lucerne fields and extensive ostrich camps. The soil, which has a Karoo-like character, yields two crops a year. It is all watered, or capable of being watered, from permanent streams, and about 24,000 acres of land are under irrigation in the district.

Leaving the seaboard and climbing the inland mountains by the railway which ascends to the top of the Hex River Pass in the west, or that which winds through the hilly ridges of the Zuurberg and Alicedale in the east, the plateau of the Great Karoo is reached. There we emerge upon arid, undulating plains more or less diversified, with flat-topped or conical-shaped hills of sandstone, shale, and trap rock. The surface of the country, which is from 3,000 to 4,000 feet above sea-level, is peppered over with

bushes, a few inches high and short distances apart, bearing a ridiculous resemblance to the arrangement of woolly tufts on a Hottentot's head. This stunted-looking vegetation is varied now and again with a line of diminutive mimosa trees, marking the course of the periodical river-beds, which for the greater part of the year are waterless. There are little or no indications of life of any sort. Farm dwellings are few and far between. Occasionally a flock of sheep, goats, or ostriches may be seen browsing on the shrubs which form the pasturage. Wild game is rarely met with. Sometimes, as the eye gazes over the wide-stretching flats it catches sight of distant waters—the one feature so much lacking in the Karoo. These are optical lakes—margined with wood or ornamented with floating islands—



SIGNAL-POST ON THE PLAINS.

the creations of mirage. They introduce a pleasing but short-lived variety into the landscape, and suggest how tantalising such atmospheric illusions must be to the thirsty traveller.

“ When the hot air quivers and the sultry breeze
Floats o’er the desert, with a show
Of distant waters mocking his distress.”

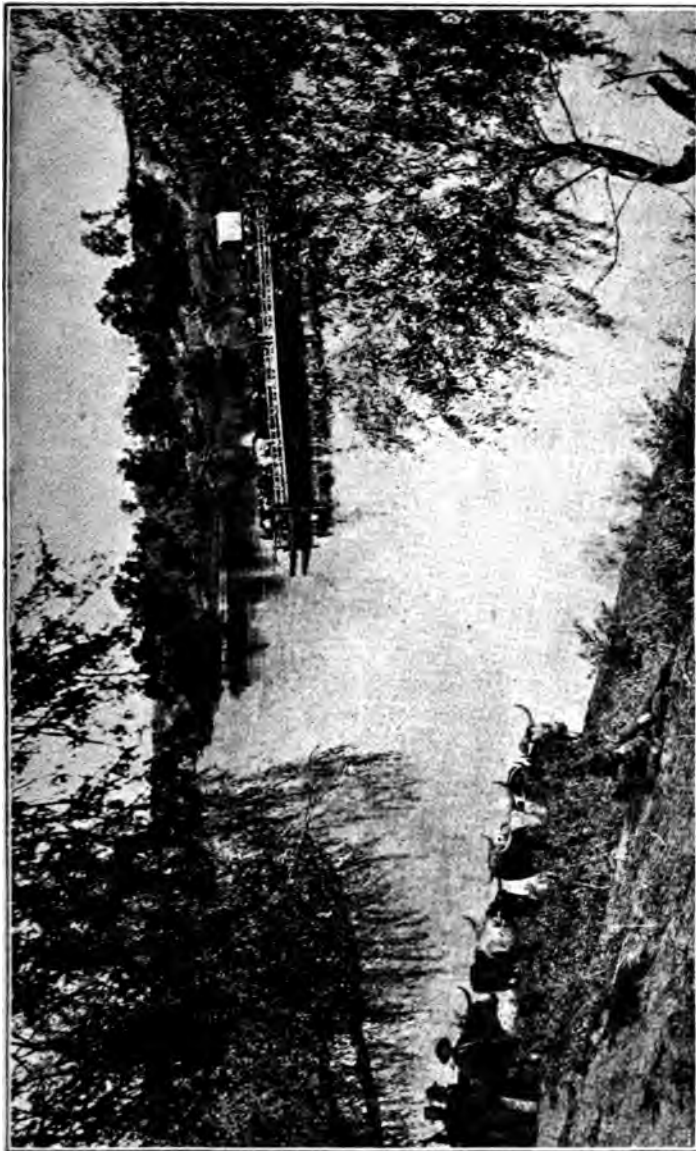
At other times portions of the country have the semblance of a brilliant flower-garden. When thunder-clouds break over any area, and heavy rain falls, it is marvellous to see the magical transformation of the sparsely-covered soil; grasses and flowers springing up with startling rapidity and in countless variety, carpeting the surface with every colour and hue. But generally the unbroken sameness of feature of the interminable plain and hill, and hill and plain, throughout this tract, makes travelling even by a fast train somewhat monotonous; and during periods

of drought, when the vegetation is withered and dry, the parched earth devoid of verdure, and the stony ridges in places like the Gouph are gleaming with heat, it becomes wearisome in the extreme.

There are many persons, however, to whom the Karoo has a singular attraction. Its sunny sky, its translucent atmosphere, its dry buoyant air—"exhilarating as wine to the senses"—its starry, balmy, and dewless nights; its measureless expanse; its vast, unbroken solitude, and even its weird desolateness, seem to have a peculiar charm, which clings to the memory of those who have dwelt in any part of it.

The Karoo plateau extends from Calvinia in the west to Middleburg in the east, and north from the Zwarteberg mountains to the Orange River, thus covering an area of considerably over 100,000 square miles. Unattractive as the vegetation on its surface may appear, it supplies a valuable fodder, suitable for all description of stock. At the higher elevations along the slopes of the mountain ranges like those of the Nieuwveld and Sneeuwbergen, grasses abound, while in the valleys grass and bush are intermingled, and on the flats aromatic bushes and shrubs prevail. The bush has an advantage over grass in that it is not injured by frost in winter, and even in seasons of drought, when it appears only a parched, brown stubble, sapless as a worn-out broom, it still affords nourishment to animals, provided drinking water is available. Stock, therefore, can be maintained upon it in good condition throughout the year. This constitutes the Karoo, a part of the best sheep-walks of South Africa. There are now depastured over its plains nearly six millions of fine-woolled sheep, in flocks varying from 1,500 to 20,000, in addition to upwards of two millions of "fat-tail" breeds, and numerous herds of goats, cattle, and horses.

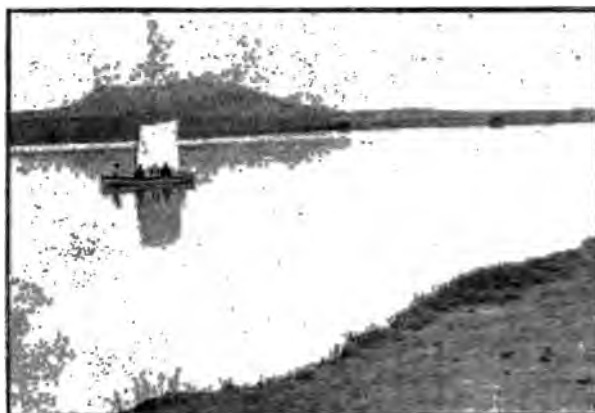
Although the Karoo districts are chiefly pastoral, the soil, like that of Oudtshoorn, is naturally rich, and only requires the stimulating power of water to produce a marvellous yield. In favourable situations along the rivers, farmers form weirs or dams, and lead out furrows from which the arable lands are irrigated; in other cases they raise the water by centrifugal pumps from the bed of streams which, like the Orange River, run at great depths below the surface of the adjacent lands. Over a great part of the country water can be found by sinking. The horizontal sandstone and shale, which form the plains, are generally intersected by igneous dykes, known to the farmers as "Yzer-klip kopjes" (iron-stone ridges). These strike vertically through the stratified beds, and arrest the veins of water which permeate them, forming underground reservoirs. By observing the natural drainage area,



PONTOON ON THE VAAL RIVER.

[To face page 12.]

and sinking alongside these dykes, springs of considerable volume may be found. In addition to the igneous dykes there are also limestone bands traversing the shale beds, and these sometimes seal up the fissures of the stratified beds so hermetically that springs are produced by their interposition in the same way as with the dykes. The number of windmills dotted over the Karoo indicates that well-sinking has of late years been much resorted to. The usual method, however, of conserving the limited rainfall is by the construction of dams, or natural reservoirs, and impounding the flood waters, which would otherwise flow off to the sea; indeed, the greater part of the country is entirely dependent upon water thus collected for the use of stock and other purposes.



DAM OF CRANMERE, PROPERTY OF G. M. PALMER, ESQ., M.P.

The physical characteristics of South African rivers are different from those of England. On a few of them, such as the Vaal, the Orange, the St. John's Rivers, and others, there are broad reaches and wood-fringed stretches of flowing water; but the greater number of them run in tortuous deep channels with bare precipitous banks. Dryness throughout the most part of the year is the normal condition of those in the Karoo. There are, however, a few, with great drainage areas, or fed from springs along the mountain ranges, which have a perennial flow, except in seasons of great drought. Among them, on the eastern side, is the Great Fish River, which has its sources in the upper part of the Cradock district, and finds its way circuitously to the Indian Ocean, and the Sunday's River, rising in the central mountain chain of the Sneeuwbergen, above Graaff Reinet, and emptying itself

into Algoa Bay. On the western side, the tributaries of the Oliphant's River drain the borders of Bushmanland and Calvinia, and carry a rich deposit of silt to its debouchure on the coast. And on the tract sloping northward from the Nieuwveld Mountains, the Zak River, a tributary of the Orange River, when in flood, becomes a stream of fluid silt, one or two feet deep, spreading over the level lands for a breadth of one to five miles, enabling the farmers along this portion of its course to cultivate extensively without fertilisers, and gather crops which appear almost fabulous.

The rainfall of the Karoo districts varies according to locality, but it may be stated at from ten to twenty inches. Over the north-western districts, of which Bushmanland forms a part, it is not more than five inches. The westerly winter rains, which visit the southern angle of the continent, do not touch this part of the country, and it is entirely dependent upon the thunderstorms of the summer-time. When these fall, the plain for miles soon becomes a grassy meadow, covered with what is locally known as the Bushman grass—"Dwa-dwa" (*Arthratherum brevifolium*, Nees.), on which all stock thrive, and quickly grow fat. This grass retains some of its nutritious qualities even when it is dry, and as long as stock have a supply of water (usually found by digging wells), they keep their condition. This extensive tract is chiefly utilised for nomadic depasturage, and is occupied by the class known as "Trek Boers," and the representatives of farmers in the adjacent districts who lease the grazing lands from Government and send their cattle there.

Alongside of this belt of dry country, the Great Orange River runs in its deep valley basin, carrying at times a volume of water estimated at 50,000 tons per minute. This stream—known to the natives and old colonists as the "Garieb"—has its source in the far distant and lofty range of the Drakensberg, on the borders of Natal. Traversing the continent from east to west, it receives as its principal tributaries the Caledon and Vaal Rivers, and carries off the southern and western drainage of the Orange Free State, Griqualand West, Bechuanaland, Great Namaqualand, and that of the northern slopes of the Karoo districts. Its length is about 1000 miles, and the area drained by it and its tributaries is estimated at over 300,000 square miles. An enormous volume of water finds its way along its course. At some places, as at the Narrows above Colesberg, it is compressed between precipitous hills into a channel of not more than one hundred yards wide; but elsewhere it attains a breadth of three to five hundred yards, and between Upington and the Great Falls it spreads over several miles, reticulating among twenty or thirty islands covered with dense bush—one of them ten miles long by one broad in its

centre. When in full flood, which occurs at intervals during the summer months, its waters rise to a great height, filling the channel from bank to bank and sometimes submerging the islands as well as the trees and bush along its margin. In the flood of 1874 it was observed to rise thirty feet in five days, whilst its speed in the deeper channels was six miles an hour. At such times, the Great Falls of Augrabbies are a grand spectacle to witness, but when it is low the water is not sufficient to create any effect. Here the river has cut a channel in the solid granitic gneiss which forms the country rock. The main chasm has a depth of two hundred feet with a width of seven hundred, and branches out into several lateral and smaller ones, extending over a distance of four miles. Above this the stream is nearly three miles wide, contracting just at the Falls, and pouring over the rocks in a succession of cascades and rapids. A striking feature which imparts grandeur to the scene is the immense boss of rock forming the precipitous wall of the gorge over which the waters rush headlong with deafening roar, while all around are a chaotic assemblage of boulders, tossed into every position, and perforated on the surface with pebbly water-worn holes, varying from the size of a cup to that of a cauldron.*



WATERFALL ON THE ORANGE RIVER.

Notwithstanding the extent and volume of the Orange River, it is yet comparatively useless for the purposes for which rivers in other countries are employed. The depth of its channel in the valley basin through which it flows has prevented its fertilizing

* These falls were first described by Mr. G. Thompson, in his 'Travels in South Africa,' in 1827; afterwards by Mr. Robert Moffat in 1856, and Mr. Dunn in 1872; and more recently, in 1885, by Mr. G. A. Farini, who counted and mapped down nearly a hundred distinct cascades, and was successful in sketching and photographing many of them, which are reproduced in his work 'Through the Kalihari'; published by Sampson Low & Co., London.

element being utilized to any extent for irrigation; and the numerous obstructions throughout its course, from the sand-bar at its mouth to the rapids and falls inland, make it practically unnavigable.

A strip of arid desert extends parallel with the western coast from the Orange River mouth to the Cunene River, having its greatest breadth in Great Namaqualand and Damaraland, and narrowing more and more towards the north. It is almost destitute of water, and there is little vegetation on the ever-shifting sand-hills, except some prickly grass and reeds, and the melon-shaped fruit of the Naras plant. Going eastwards the country gradually changes to a more fertile region; the further from the sea, the more the vegetation improves. The dreary sand hills are succeeded by characteristic Karoo bushes, whilst further east patches of mimosa alternate with open, grassy glades and forests of the larger thorn trees. The greater part of Damaraland is a well-pastured country, carrying innumerable herds of native cattle, and from the central watershed of the Eyto Mountain (7,000 feet above the sea level) springs and streams flow east and west, and plains of rich alluvial soil slope away towards the central basin. Over these plains there are, strictly speaking, no river beds or ravines to mark the periodical streams, but only a scarcely-perceptible indentation or surface depression termed "Omurambe," of which the Omurambo ou Omatoka is one of the principal. Although covered with high rank grass, water is always found in them at a depth of six to ten feet.

The Kalihari desert is not devoid of vegetation. To a great extent it is covered with nutritious grasses, bushes and trees; and in the southern, western, and eastern parts it is occupied by farmers, Bastards, Hottentots, and others, some of whom have lately gone in from the Cape Colony with their flocks, finding good pasturage in many places, and obtaining water by sinking in the sedimentary rocks. Portions of it, however, consist of great stretches of sand dunes, alternating with many miles of limestone flats. These sand dunes, which run from W.N.W. to E.S.E. sometimes rise from fifty to one hundred feet high, and present the appearance of a sea of sand in successive waves or billows. Over these sandy wastes varieties of the "Dwa-Dwa" grass and fodder plants are found interspersed with trees, chiefly mimosas, kameel, witgat, and wacht-en-beitje. In some localities the trees are thickly grown, and present quite a forest-like appearance. No waters run on the surface. The rivers, such as the Molopo and Hygab, which appear on the maps as traversing the country, are dry beds whose waters inexplicably vanish. The Molopo, for instance, is a fair stream from Mafeking to Pitsanie, but thence it

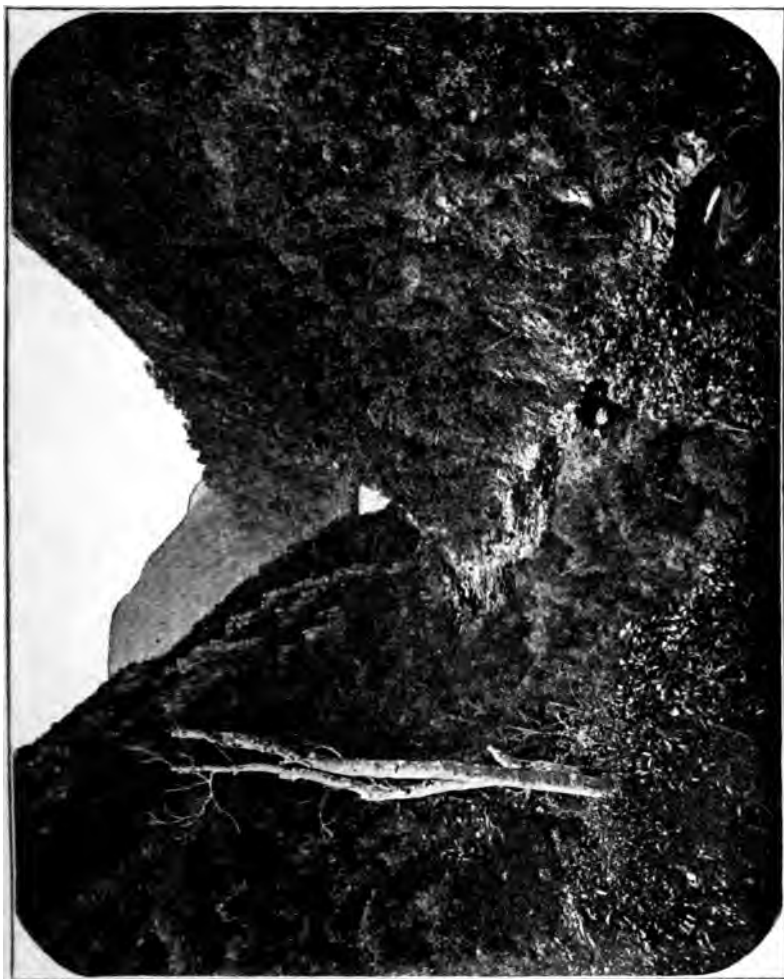
diminishes gradually, and at Lotlakani is entirely lost. There is every likelihood, however, that all over the Kalihari natural underground reservoirs exist, awaiting to be opened up by enterprising and intelligent well-sinkers. When this is done, the country may be found to have great pastoral capabilities. At present Nature has provided a wonderful substitute for drinking water in the Tsoma plant, which covers a great part of the ground, and for three or four months of the year bears a fruit in appearance very like a small round water-melon, supplying both food and drink for man and beast. During rainy seasons, when the Tsoma is known to be plentiful, the Bushmen, Bakalahari, and other native hunters, make the desert their home, chasing and killing wild game and ostriches, which are at times very numerous. But the central part, extending from the supposed underground course of the Molopo River northwards to near Lake Ngami, may be said to be as yet practically unexplored, and uninhabited by white men. The Trek Boers, who crossed the eastern side of it in 1877-78 on their route to Ovampoland and Humpata, endured great suffering from the absence of water, and aptly gave it the name of Dorstland (Thirstland). Even in the northern parts of Bechuanaland, outside the Kalihari, there are long reaches without much surface water, and the traveller has to journey sixty or seventy miles at a time before either sand river, pit, or vlei is met with to refresh his cattle. Such is the character of the road from Khama's picturesque town of Palachwe northward to the Botletle River on the way to Lake Ngami, and likewise along the route northwards by the great salt lake of Makarikari to the Victoria Falls of the Zambesi.

Leaving these waterless wastes of the Dorstland and the inland plains, we turn to the region on the eastern side of South Africa facing the Indian Ocean. Here are the highest mountains, the finest forests, the most verdant slopes, and the richest valleys. Water is abundant, running streams intersecting and traversing it in all directions. And along its shores, the warm ocean current, flowing south from the Mozambique Channel, contributes to maintain a uniformly luxuriant semi-tropical vegetation.

Commencing at the valley of the Brak River, near Mossel Bay, we enter upon the grassy flats, common to the south-eastern coastlands, and known as the "Zuurveldt," or "sour grass," country from the absence of saliferous and alkaline ingredients. At the George and Knysna we have what is rare at the Cape, a combination of mountain, forest, and lake scenery. The slopes of the Outeniqua Mountains, and the abrupt ravines through which

the crystal streams of the Kaieman and Silver Rivers flow, are all clothed in wooded beauty, and on the flats below are the placid waters of the George Lakes, stretching for two or three miles near the margin of the sea. The basin in which the village of Knysna lies makes an equally attractive picture, with its land-locked waters surrounded by verdant hills, alternating with the glossy sombre forests rising, range above range, to the distant highlands in the background. These forests, the greater portion of which are wholly virgin, extend for a distance of over a hundred and fifty miles. From the Knysna, on to Blaauwkrantz and Zitzikamma, at intervals they cover hill and valley and deep ravine, diversified here and there with grassy glades, dense thickets, and tangled brake, where elephant and buffalo still find shelter. Under the green spreading foliage, and amidst a dense mass of vegetation, you catch sunlit glimpses of rich and varied forms of flowering plant life; while monarch Yellow-woods of majestic stature rise overhead, some with the parasite "old man's beard" swinging from their branches like grey locks, and others with festoons of the wild vine or other climbing plants running up their boles, or clustering over their crowns. Penetrating the shaded recesses, as far as the tangled undergrowth will permit, you can realise that amidst all that is wildly luxuriant and beautiful, "Nature reigns supreme in awful loneliness." The deep, impressive silence of these woods is continuous and unbroken, save perchance by the wind rustling among the trees, the chirp of an insect, or the movement or note of a bird—the beautifully-coloured loorie, or the golden-coated oriole hopping from branch to branch; or it may be the bell-bird, with its solemn chime, tolling at intervals like the clang of an anvil.

These primeval forests, which yield a never-failing delight to the traveller, terminate near to Humansdorp. The general aspect of the country from there is not so romantic or attractive until the Van Staaden's River Valley is reached (about twenty-five miles from Port Elizabeth), where that lover of Nature, the late Miss Marianne North, was so charmed with the scenery and the indigenous vegetation. The pleasing variety, characteristic of the eastern districts, is now met with. Hill and dale succeed one another, with clumps of evergreen shrubbery and broad grassy lawns between. The gaunt leafless Euphorbia; the Aloe, with its spear-like leaves and tall scarlet spikes; the spiny palm-like *Zamia*; the Spekboom, with its pale green foliage and bright blossoms; the elephant's foot, the *Strilitzia*, the ivy-geranium, the Plumbago, and numerous other shrubs and flowering plants, make their appearance, whose strange and peculiar forms at once strike the eye. These are common to the tract of "bush," as it is



[To face page 18.]

BLOAUWERANTZ RIVER FOREST.

termed, which stretches with few breaks from near the Sunday's River, across the Addo Heights and the Bushman's River, to the Great Fish River, along both sides of which it forms a belt several miles wide. The trees and shrubs are not of great height, but form an impenetrable jungle, in some places so excessively dense that there is no getting through except by the old elephant paths. In former war-times, the Kaffirs occupied these thickets as natural strongholds, whence they could surprise their objects of attack or elude their pursuers; and to clear them it was suggested that the bush should be burnt down, but owing to the vegetation being so succulent, fire had little effect upon it, even in the driest weather. Now, however, the woodman with his axe is gradually encroaching upon it, for fuel supplies to the adjacent towns.

The heights of the Great Fish River near to Breakfast Vlei, beyond Graham's Town, command an extensive prospect of what is most striking and attractive in the features of this section of the country. It is a glorious panorama of park-like grassy slopes, deep woody kloofs, verdant ridges, precipitous rocky gorges, and open valley basins, with a background of towering mountains whose peaks, sometimes snow-capped, melt into the haze on the distant horizon. These mountains are the chain of the Great Winterberg, attaining to an altitude of 7,800 feet and extending eastwards as the Didima, the Katberg, Elandsberg, Gaikas Kop, and the famed Amatola or Seven-kloof Mountain, terminating in the Buffalo and Kologha Range in the division of King William's Town. Along many of these, other parallel ranges and spurs of lesser elevation curve in and out enclosing intervening fertile glens and open valleys; and from different points there flow down streams and torrents which form the Koonap, the Kat, the Chumie, Keiskamma and Buffalo Rivers. On the northern side of the mountains, again, there are the rolling grassy uplands of the Bontebok Flats and Cathcart, and the succession of grassy basins and hills of the Queen's Town division, rising upwards to the higher plateau of the Stormberg and the Drakensberg.

Seventy years ago the whole of this portion of the Cape Colony was uninhabited by Europeans. It was only after 1820, when the British settlement was formed in Albany, that it began to be occupied. Those early pioneers had a very trying initial experience. Rust blighted their first year's crops, floods swept away their newly-built houses and gardens, Kaffir thieves carried off their cattle, and more than once they had to brave the surge of savage warfare. But they struggled heroically through all their difficulties, and ultimately succeeded as well as emigrants have done anywhere, not only establishing themselves on the pasture-

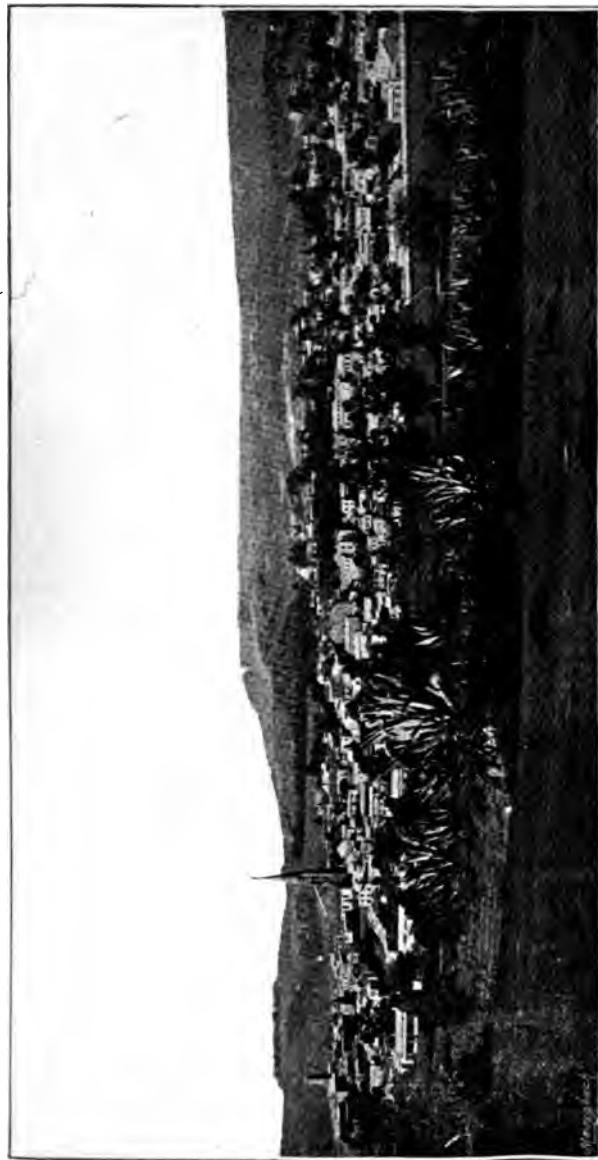
lands and soil, but also developing manifold commercial enterprises in various directions. At the sources of the Kowie River, where in 1820 there was only a military barracks and a dozen small houses, the city of Graham's Town now covers the wide valley basin with its cathedral and churches, its courts, town-hall, and museum, its colleges and schools, its shops and stores, tree-lined thoroughfares, and its English community. And where a small fortification and a few thatched cottages along the barren sand-hills were the only evidence of civilisation on the shores of Algoa Bay, there is now the wide-extending, prosperous, and populous seaport town of Port Elizabeth. Throughout these eastern districts, other towns and villages have been established, such as Queen's Town, King



PORT ELIZABETH FROM THE HILL.

William's Town, and East London, whose rise and progress within the last twenty-five or thirty years is phenomenal. Cattle-rearing, wool-growing, and agriculture have been the staple industries contributing to their advance and prosperity. In this part of the colony the best fattening pastures are to be found, and some of them carry more stock per area than any other part of South Africa. In Stutterheim the density of fine-woolled sheep per square mile is 445·16; in Barkly East it is 389·58, and in Cathcart 324·74. Over the whole of these eastern districts upwards of four millions of merino sheep are depastured, besides cattle, horses, ostriches, and goats.

Progressing eastwards, and crossing the Great Kei River, we enter what is known as the Transkeian territories. This formerly bore the general designation of Kaffirland, from its population being entirely of the Kaffir race; but now there are a considerable number of Europeans settled throughout it, and towns have sprung up at the principal seats of magistracy. But the mass of the population, if not a savage, is at least an uncivilized one.



GRAHAM'S TOWN.

[To face page 20.]

Dotted everywhere over the country, but principally on the rising ground and hill tops, are the numberless kraals or circle of huts of the native inhabitants, with their cultivated lands or gardens down in the valleys, and their sleek cattle grazing on the grassy slopes. The broad features of the country are much in common with those of Natal, which adjoins it, and unitedly they form by far the fairest portion of South Africa. The great mountain chain of the Drakensberg marks their north-western boundary, running like a great wall or buttress of rock at an elevation of from 6,000 to 11,000 feet, and at distances varying from one to two hundred miles from the coast. From this high elevation the land slopes continuously downwards to the ocean. The descent, however, is made by successive steps or terraces, so that the country is divided into various plateaux differing slightly in character, but with a great varying range of temperature, from the peaks of the frequently snow-clad Drakensberg to the tropical shore-belt. The natives gave the high mountain range the name of Quathlamba, signifying a mass heaped up in a jagged manner, and this fittingly describes its appearance from many parts on its eastern side. The rocks on its summits assume the most fantastic shapes and forms, and it requires but a little stretch of the imagination to see castles, turrets, spires, and pinnacles in their rugged heights. Along their base a belt of undulating country, covered with coarse grass, is followed by a succession of wood-crested hills and open valleys abundantly pastured. It is all dissected by mountain torrents, most of which unite as they reach the middle terrace, forming the large rivers known as the Bashee, the Umtata, and the Umzimvoobu. Waterfalls are numerous, the largest being on the Tsitsa River, along the main road from Umtata to Kokstad, where the water, after running through some wooded gorges, rushes over the edge of a precipice into an abyss 375 feet below. From the central plateau, the land breaks away to the lower terrace; and following the ridges of the watershed there are some wildly picturesque views to be had of the rocky ravines and huge perpendicular krantzies along the river channels, as well as charming glimpses of the grassy hills and bushy valleys extending down to the ocean's edge.

The finest scenery, however, is at the Umzimvoobu or St. John's River mouth, which may be reached from Umtata through Western Pondoland, and from Kokstad in Griqualand East, or by steamer along the coast from Natal. Approached from seaward, the river mouth is a noticeable object. A lofty table-topped mountain appears to have been rent asunder, leaving a wedge-shaped gap through which the river flows to the sea. The edges of the cliffs, which near to the mouth lie about 2,000 feet apart, approach each

other, until at the top of the first reach they are 1,500 feet wide; rising in abrupt forest-clad steeps to a height of six to seven hundred feet. From these mountain edges, on both sides of the river, plateaux extend until on each side other precipitous cliffs rise, which culminate about a mile-and-a-half from the sea, where they attain a height of near to 1,200 feet. These are the well-known "Gates" of the St. John's or Umzimvoobu River.

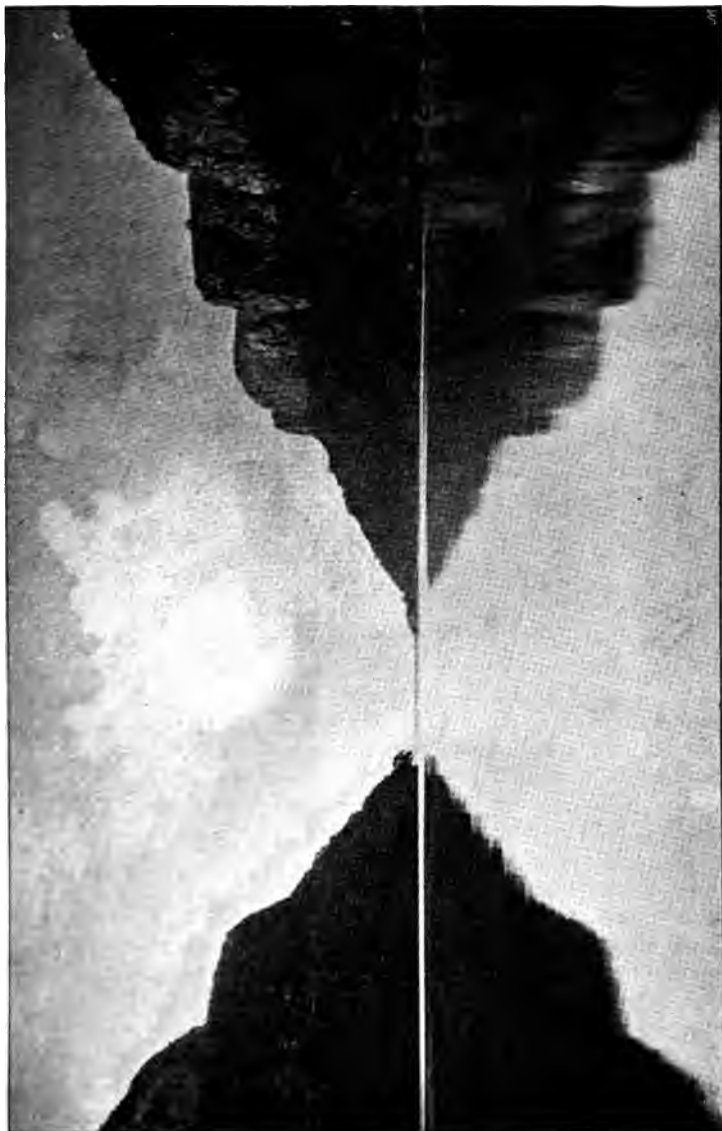


THE GATES OF ST. JOHN.

"Like giant sentinels on either hand,
The stately portals of the river stand,
Their rugged crests, and headlands bold and free,
Rising in silent grandeur o'er the sea,
Whose foaming waves engird with silvery showers
St. John's grand cliffs and castellated towers.
Low at their feet, in deep eternal shade,
The river flows past mountain, krantz, and glade,
Onward and onward from its distant source,
Till, midst this scene sublime, it ends its course." *

After passing through the channel, which has a depth of 14 feet on the bar, the river broadens into fine reaches, and may be ascended for a distance of ten or twelve miles when the elevated lands fall back, forming a fine amphitheatre with gracefully-

* Lines by "Adean" (J. F. Ingram Esq.).



[To face page 22.

ST. JOHN'S GATES—LOOKING SEAWARD.

swelling hills on either hand. From inside the "Gates," looking seaward, where the white line of foam indicates the union of the river with the ocean, is an exceedingly beautiful view. Here the river has more the appearance of a lake than of a rolling stream. There is an expanse of lovely sky-blue water nearly five hundred yards wide, between stately mountains and luxuriantly-foliaged hills. The steep-wooded slopes come down to the water's edge, and in some spots the thick tangled forest growth overhangs the margin, forming natural arcades. To appreciate the unique character of the scenery, one must witness the indescribable beauties of the spot and its surroundings—long, silent, vistas of forest, with the ripple of water sounding through them, tumbled masses of rock covered with mosses, ferns and flowering creepers of all sorts, in most bewildering luxuriance, twining in heavy clustering masses around majestic old trees, whose every bough and leaf find their reflection as in a mirror in the placid waters, until in some places it is difficult to tell where the reality ends and the shadow begins. The exquisite semi-tropical vegetation, African in its type and almost Brazilian in its beauty; the charms of light and shade over the grand panorama of mountain, wood, and water; and the glimpses of hill and dale, forming the high lands in the extreme distance and seemingly merging into the cobalt sky, furnish a picture of virgin Nature untouched by Art rarely to be met with.

The coast-lands of Natal, which may be seen from the deck of any of the mail-steamers passing along its shores, never fail to attract attention and charm the eye. They form a succession of undulated and rounded hills, swathed in a luxuriance of grass, bushy foliage, and bright blossoms. Sometimes they extend for miles without a sign of life or of man's industry, and impress one with a sense of exuberant African wildness. In various situations, however, the sylvan scene is enlivened and humanised by the appearance of verandahed houses and homesteads, picturesquely perched on the airy hill-tops, in the centre of what seem to be natural landscape gardens; and around them, on the swelling outlines of adjacent hills, are fields of sugar-cane, or patches of coffee or tea plants, with groves of mangoes, bananas, or pines. Immediately behind, the country opens out into higher elevations and deeper valleys, ornamented with wooded copses and park-like glades, and then suddenly rises to the midland and upland terraces, where semi-tropical beauty and luxuriance is exchanged for the characteristic features and more familiar productions of the temperate region.

At no great distance from here is the highest land in South Africa, to which the first French missionaries in Basutoland gave

the name of "Mont aux Sources." It is easily reached by railway from Durban to Harrismith, and a day's cart journey from there to Witziesshoek, where the final ascent to the loftiest accessible point is made over bridle-paths on horseback. The great chain of the Drakensberg attains its culminating height near where the boundaries of Natal, Basutoland, and the Orange Free State join. From the Natal side it has the appearance of a perpendicular rocky rampart, with bold prominent crests—one of which, designated Champagne Castle, is about 12,000 feet, and the other, named Giant's Castle, about 11,000 feet high. On the other side there is no marked dip or fall of country, for the mountain is but the rim or edge of the great central plateau extending, with undulating sweep, westward and northward. Here, however, parallel ranges occur, forming a series of lofty ridges, known to the Basutos as the Maluti, or Double Mountains. This is the Alpine region of South Africa, with grand and savage scenery—a land of jagged peaks and scarped precipices, of wind-swept bleak hills and snow-clad summits, of rushing streams and foaming cataracts. Within an area of not more than thirty or forty square miles, the head waters of the Orange, the Vaal, the Caledon, and the Tugela rise and flow to the Atlantic and the Indian Oceans respectively. The "Great Divide" is between Champagne Castle, or Cathkin Peak, and the Mont aux Sources, where the water seems to well out of the shallow valleys and swamps in the broken country between the mountains. Three different streams, named by the Basutos the Sengu, Seate, and Semenu, run southward, forming the head tributaries of the Orange River. Another stream, the Muchachaning, flows westward, forming the Caledon River, which afterwards also joins the Orange. A third, named the Eland, flows north, joining the Wilge and the Vaal Rivers, and ultimately unites with the Orange River, making a circuit of nearly 1,700 miles before it reaches the Atlantic Ocean. A fourth, rising in a valley parallel with that of the Eland, and not many miles distant from where it has its source, flows due eastward over the rocky cliff of the Drakensberg, falling in an unbroken perpendicular stream for nearly 1,800 feet, and winds its way through Natal to the Indian Ocean. The scenery on the mountains, when not obscured by rain or cloud, is strikingly superb; and at some points it presents features unequalled anywhere for sublimity and beauty. On the western side, overlooking Basutoland, there is a billowy sea of mountain peaks and crests, deep river valleys, precipitous gorges, and rushing waterfalls, like those of the Maletsunyane, leaping 630 feet from the top of the cliff to the basin below. To the northward there are the plains of the Orange Free State, the heights of the historic Amajuba,

the Highveldt of the South African Republic, and the northern portions of Zululand ; while, looking over the eastern ridge of



MALETSUNYANE FALLS, BASUTOLAND.

the Drakensberg, the “garden colony” of Natal is spread out like a map, presenting an extended vista of ridges, conical hills,

flat-topped mountains, cup-shaped valleys, gleaming rivers and endless breadths of grassy sward, darkened here and there by the more sombre tints of bush and forest, and bounded by the sea.

The Drakensberg continues to mark the margin of the high plateau as it stretches away on the eastern side of the South African Republic; and between it and the coast are a series of gradually sloping terraces bounded by a minor range named the Lobombo, which, with a width of about ten miles and an eleva-



PIONEER'S CREEK, MOODIE'S GOLDFIELDS.

tion not exceeding 1,000 feet, extends from the Zululand border north to the Limpopo. The principal mountain range, at some points along its line, still shows the characteristic rocky escarpment, as at the Goodwan Plateau, where it presents a precipitous face of 1,500 feet, fronting the Kaap Valley and the auriferous tract of the Barberton, Sheba Hill, and Moodie's Goldfields. In other places it forms broken and detached mountains, some of them, like Spitzkop and Mauchberg in the Leydenberg district, having an altitude of 6,000 to 7,000 feet, while many of the elevations are cut into broad rich valleys and wide expanses of fertile lands, lying in magnificent sequestered solitude. Diverging more and more from the coast, it trends northward and joins

the tablelands of the Zoutpansberg district with Eersteling, Mount Mare, and Pietersburg on one side, and on the other what is termed the Low Country—a beautiful fertile region, but sickly in summer, covered with trees and luxuriant tropical vegetation, and including within it the gold-bearing zone of the Murchison and Sutherland ranges. The opening of the Selati Railway from Komatie Poort to Leydsdorp will soon aid in the development of its rich resources.

The line of the Drakensberg still forms the main watershed.



TIGER'S CREEK, LEYDENBERG.

From its eastern slopes the Ingenya, or Crocodile, the Sabi, and the Komatie take their course towards the Lobombo, where they unite as the Umkomogazi, Manice, or King George's River, discharging itself into Delagoa Bay. From the tablelands on its western side at Witwatersrand there rise the sources of the Limpopo, or "Krockodile" River, as it was named by the Dutch pioneers, on account of the number of crocodiles frequenting its waters. This river, in a course of little less than 900 miles, describes nearly three-quarters of a circle, first running north-west, then north and east, forming the boundary limits of the Republic, and then turning to the south-east, where it flows into the Indian Ocean. Its drainage area includes, besides the South

African Republic, a considerable portion of Bechuanaland, Matabeleland, Mashonaland, and Gazaland; but, like other South African streams, it is unnavigable except for a distance of sixty miles from its mouth, and then only for light-draught vessels.

At the north-eastern corner of the Republic, on the edge of the plateau where the land drops off coastwards, are the Tolo Azime Falls of the Limpopo. These form a series of cataracts by which the river precipitates its waters through a huge rent in the land to a lower level. The late Capt. Elton, who visited them in 1870, describes their peculiar formation and surroundings as of sufficient interest to repay the exertions of any traveller who may direct his steps that way. Above the Falls, the river rushes in a dozen different channels in seething and foaming rapids, separated by islands, and then, on reaching the gorge, leaps in a succession of parallel cascades (six in number) into the abyss below, thundering majestically and almost obscured by clouds of spray rising from the torrent which races down into a circular basin surrounded by high escarped cliffs, whence it escapes by a deep narrow outlet on its seaward course.

In these tropical regions, the country between the foothills of the inland terraces and the seaboard, as well as along the river valleys and minor elevations, is apt, especially during the summer season, to be unhealthy for men and animals. It is subject to malarial fever and the deadly tsetse-fly. For the insect pest there is no known remedy, for it decimates cattle, horses, asses, or any beast of burden. The fever, however, succumbs to careful treatment; and as a precaution against it, elevation of residence, proper food and shelter, strict attention to rules of health and temperance, and avoidance of the miasmatic air of night or early morning, are of importance. But experience has shown that the more rapidly the fever tracts are passed through, and the healthy higher country reached, the better it is. From the shores of Delagoa Bay and through the river valleys of the Komatie and Crocodile, a railway now quickly carries the traveller to the uplands of the Drakensberg and the Highveldt; and over the flats of the littoral at Port Beira, and through the fly-belts along the Pungwe River, another line of railway has just been laid down, facilitating passage and transport to Umtali and Salisbury on the elevated plateau known as Mashonaland.

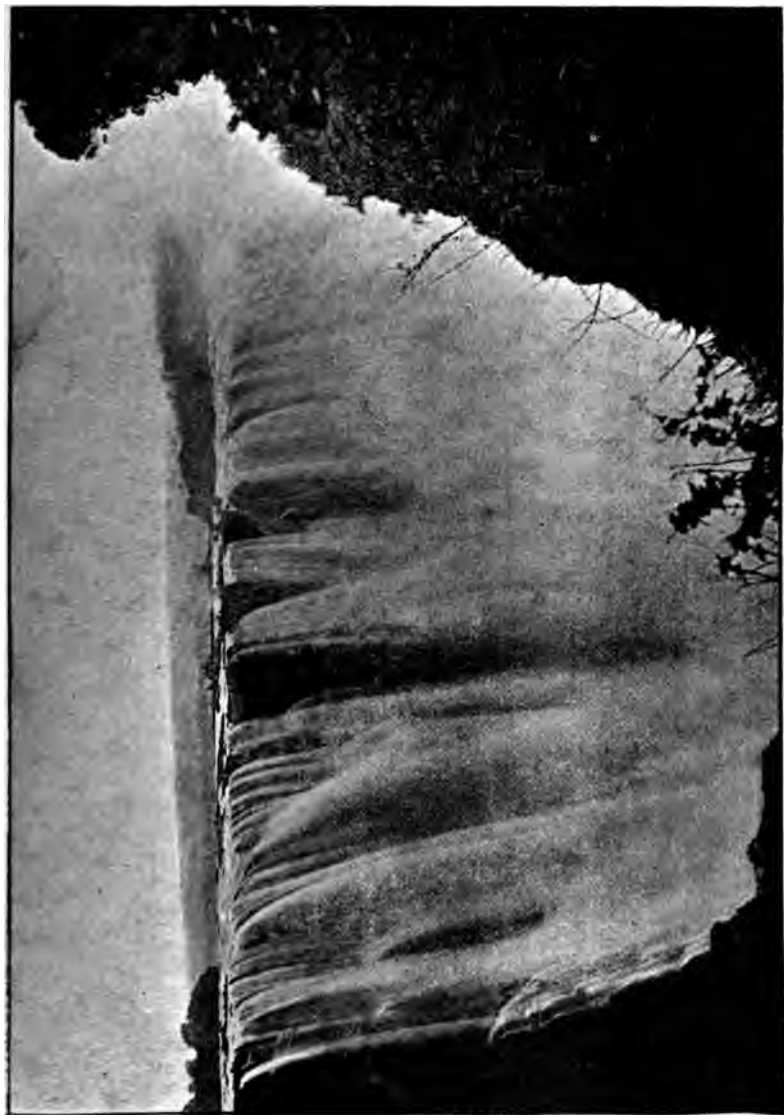
This is the territory recently opened up to colonisation by the British South Africa Chartered Company. It has an area of about 150,000 square miles between the Limpopo on the south, the Zambesi River on the north, and the Portuguese possessions on the east. Its north-western part is occupied by the Matabele, a Zulu tribe who established themselves there fifty years ago,

and on its eastern and southern slopes are broken remnants of the Makalaka tribe, commonly named Mashonas. Its centre is Fort Salisbury, on the high slopes of the watershed formed by the Matopa and Umvokwe Mountains. Although it lies within the tropics, and only 18° south of the equator, its great elevation—from 4,000 to 5,000 feet above sea-level—counteracts any injurious effects, making it climatically healthy and fit for Europeans. A cool south-east trade wind blows nearly all the year round, and the temperature ranges from 36° to 86° Fabr. Rain is plentiful in the summer (from September to March), but scarcely a drop falls during the winter season, which is dry, bracing, and invigorating. Generally speaking, fever is confined to the lower portions of the country, where the gigantic baobab and the mopani trees grow, below the altitude of 2,000 or 3,000 feet. Many parts are surprisingly beautiful. Wood, dell, and water oftentimes vary the landscape. There are fine stretches of forest and bush, and tree-clad slopes and parks alive with herds of varied wild game. There are great granite hills of rugged character and picturesque variety of form. There are rich grazing lands and good arable soils, with a network of streams springing from the higher lands and running near the surface, giving favourable facilities for irrigation. The few native Mashona inhabitants cultivate tobacco, rice, sweet potatoes, maize, beans, pumpkins, and other vegetables; but there are traces of agriculture on an extended scale in former years, when a considerable population must have occupied the land; and unique ancient ruins and old reef-workings attest that at some far-remote period it was occupied by a colony of the early gold-seeking races of the north—possibly Phœnicians or Sabæans. On the sites of some of the ancient primitive workings, and over a wide stretch of virgin country from Victoria on the west to Mazoe and Umtali on the east, gold-bearing formations associated with the stratified rocks have been found and tested to a considerable depth, and several of them have proved so far to be wondrously rich. Their full development and working has been awaiting the advent of the Beira railway, now completed, for the transport of mining and ore-crushing machinery. If the roseate views of the prospectors are even only partially borne out, by the production of gold in the next year or two, the mineral wealth of Mashonaland will be a magnet drawing thousands into this new country to participate in the abundance of its riches.

One other natural feature remains to be noticed—the Victoria Falls of the Zambesi River, named in the native Sechuana language, *Moose-oa-tuneya*, or “The smoke that sounds.” These form the most wonderful sight in South Africa. For grandeur and magnificence they rival the Falls of Niagara. Dr. Living-

stone, the explorer, was the first to bring them to the notice of the world in 1855. They were afterwards vividly described and pictured by the pen and pencil of the artist traveller, Mr. Thomas Baines; and within the past year their beauty and picturesqueness at every point have been successfully photographed with the camera by Mr. W. Ellerton Fry. The opening up of the route to the north has made the approach to these Falls much easier than it was before, and they may now be considered as almost within the happy hunting-ground of the globe-trotter, or the visitor seeking pleasure, recreation or health. To get to the Falls the only practicable way is by ox-waggon from the railway terminus at Vryburg, or from Mafeking, when the railway will be open to the latter place. It involves a journey extending over from six to eight months there and back. A visitor may arrange for all the details of transport with some reliable person who has been through the country before, and knows the route and the difficulties of travelling along it. By leaving Cape Town in the month of March, he will be able to fit out at Vryburg or Palachwe, to spend a week or two on the road hunting when the big game is at Thlamakinyana or at Daka, to visit the Falls at all points, and return again to Palachwe, while there is sufficient pasturage and before the waters dry up along the road. Stores and supplies will have to be taken, as but little food besides milk can be got from the natives. If the visitor is a keen hunter, sufficient game can be shot to furnish fresh meat, as after leaving Khama's cattle-posts there is wild game in abundance, from elephants down to the small antelopes, and partridges, francolines, guinea-fowl, as well as duck, where there is water. Panda-ma-tenka, distant about 380 miles from Palachwe and 60 miles from the Victoria Falls, is the furthest point to which waggons and cattle are taken, as beyond there the tsetse-fly is found. The remainder of the journey can be done on foot or with carriers. July or August are about the best months to be there, for there is sufficient water then to make the Falls a grand scene, and the climate is enjoyable and healthy.

The Zambesi is the largest of all the African rivers which flow to the Indian Ocean. It has its sources in the marshes of Lake Dilolo, between 11° and 12° south latitude, and running south through the Barotse country, turns to the east, receiving the waters of the Chobi. It then proceeds on its course, a broad tranquil-flowing stream, through many large islands bordered with palms and covered with luxuriant vegetation, until suddenly it falls over the edge of a chasm of hard basaltic rock into an abyss four hundred feet deep, the foaming mass of waters rebounding and thundering below, and sending up high columns of vapour



[To face page 30.]

THE VICTORIA FALLS, ZAMBESI RIVER.

nearly always tinged with prismatic colours, and visible sometimes at a distance of sixty miles. The chasm into which the waters fall is one mile long, 100 yards wide, and 400 feet deep. Below this the river is contracted into a space of about seventy yards, and rushes, boiling and roaring, between perpendicular fissured cliffs some 400 feet high, in a southern direction for a considerable distance, until at Wankie's Town, near Logier's Hill, it emerges on the open plains. Close to the Falls the vegetation is superb; the umbrageous trees, ferns, and flowers are constantly watered by the ascending spray, and the effect of this in the tropics is an arboreal and botanical garden, beautifully clothed with a profusion of colours. The immense volume of water poured over the Falls when the river is in flood, the great height of the flow, the wondrous altitude of the ascending spray clouds, the brilliancy of the rainbows, and the gorgeous tropical scenery, all combine the elements of magnificence and beauty, and many who have seen both the American and the African cataracts, have expressed the opinion that the Victoria Falls of the Zambesi is the grander of the two. To quote the words of Mr. F. C. Selous, it is "one of, if not *the* most transcendently-beautiful natural phenomenon on this side of Paradise."

CHAPTER II.

GEOLOGY, FOSSILS, AND MINERALS OF SOUTH AFRICA.

ALTHOUGH the richest of metals and the rarest and most valuable of precious stones have been found in South Africa, there has not as yet been any systematic geological survey of the country. Only in some isolated portions of it have any details been worked out. But the labour and investigations of several qualified observers, embodied in published topographical and geological reports, supply materials for attaining to tolerably definite conclusions as to the main features of the rock-formations. In character and grouping most of them are the equivalents of well-explored analogous formations in Europe, Australia, and India.

The first observations, which formed the foundation for all subsequent work, were made by the late Mr. Andrew Geddes Bain, whose name is honourably associated with the country as the constructor of the magnificent mountain passes of the Cape Colony. In the course of his official duties as a road engineer he had specially favourable opportunity of study, and although an amateur, working purely from love of the science and without any aid from Government, the results of his labours elicited the highest commendation from the Geological Society, who published his papers, accompanied by map and sections, in the volume of the Society's Transactions for 1856. Shortly after this, the indications of mineral wealth in the copper districts of Namaqualand induced the Cape Government to secure the services of Mr. Andrew Wyley, of the British Geological Survey, for a period of three or four years. The work performed by him consisted of an exhaustive report on the geology of Little Namaqualand, and a detailed account of a visit to the Stormberg, and of two journeys across the Colony, describing the various formations he met with. Unfortunately, just as he had acquired a general grasp of the geology of the country, his services were discontinued by the Government, and his valuable experience lost. In 1871, Mr. E. J. Dunn, F.G.S., of the Geological Survey of Victoria, who was highly

recommended by the late Mr. Daintree, the accomplished Government Geologist of Queensland, undertook some prospecting and geological investigations for the Cape Government. He traversed the south-eastern coast districts from Caledon to George; also the north-western region of Bushmanland, portion of Little Namaqualand, and the coal-bearing districts of the Stormberg, embodying the information obtained by him respecting the coal-fields in a map and sections, shewing their value and extent. Mr. Dunn was also engaged to explore various localities in the Orange Free State, Natal, and the South African Republic; and although this intermittent research did not allow of any scientifically-connected working out of the geology of the country, it enabled him to prepare and publish a geological sketch map of South Africa shewing the various rock systems and their relative positions, so far as the same have been as yet determined.* In this compilation were embodied the results of Mr. Dunn's personal investigations as well as those of others whose zealous labours and investigations had thrown light upon the subject, among whom may be named Dr. W. G. Atherstone, of Graham's Town, the late Dr. Rubidge and R. Pinchin, of Port Elizabeth, and Mr. George W. Stow, of Queen's Town; Mr. T. Bain, the Geological and Irrigation Surveyor of Cape Town; Dr. Sutherland, of Natal; and Mr. E. Button, of the South African Republic.

The ancient sedimentary deposits of the Palæozoic or primary formation constitute the littoral zone, and are noticeably developed over the southern and western parts of the Cape Colony and the eastern side of the South African Republic. The lower members of the group are clayslates, varying from soft mud stones to fine argillaceous schists and gritty sandstones. Cape Town stands on these rocks. They have been designated the "Malmesbury" and "Leydenburg" beds, from their common occurrence in these districts, and they are classed as Silurian. Through and over these old rocks masses of granite were protruded, outcrops of which occur at Sea Point, Platteklip, and Wynberg, in the Cape Peninsula, as well as at the Paarl. There is a large area of it spreading as the basement rock north-west to Namaqualand and Damaraland, where the prevailing formations are granite, gneiss, metamorphic slates and limestones. To the eastward there is an intrusion at Mossel Bay and George, and again in Natal. The granite reappears in

* Published by Sands & Macdougall, Melbourne (1875), and Juta & Co., Cape Town. A geological map of the Transvaal (South African Republic), by Mr. F. P. T. Struben, has been published by J. Wyld, Charing Cross; and a volume on the "Geological Features of the Transvaal," by Charles J. Alford, F.G.S., published by E. Stanford, Cockspur Street, London.

mass in the South African Republic, notably in the De Kaap Valley and Zoutpansberg, where it is flanked by metamorphic rocks, and penetrated through by trap dykes. Thence it extends over the high plateaux of Bechuanaland, Mashonaland and Matabeleland, where it forms picturesque pinnacles and rounded domes.

Lying unconformably on the clayslate, and above the granite and gneiss, and the metamorphic schists and limestone associated with them, is a great horizontal deposit of quartzose sandstone, with, in some places, embedded pebbles. This forms the well-known stratified rock of Table Mountain, the Lion's Head, Drakenstein, Hottentot's Holland, Langebergen and other coast mountain ranges. It constitutes the elevated hills of Great Namaqualand and the tabular elevations in Natal and the South African Republic. Like the clayslates of the lower horizon, it has as yet proved entirely unfossiliferous. But resting upon this quartzose sandstone, in the second belt of mountains,—stretching from the Cedarbergen and Bokkveld, and along the railway ascent at Hex River, to the flanks of the Great Zwarteberg at Seven Weeks' Poort,—are deposits of argillaceous shales abounding in organic remains of trilobites, branchiopods, encrinites and other fossils characteristic of that subdivision of the primary or Palæozoic period known as the Devonian, or old red sandstone.

Conformable to these fossiliferous deposits is a white coarse sandstone and quartzite, forming the Wittebergen or Klein Zwarteberg on the west, and the Groot River Heights, Klein Winterhock, and Zuurberg as far as Albany, in the east. This Mr. A. G. Bain and Mr. Wyley classed as carboniferous, from *Lepidodendra* and other fossil plants of the carboniferous era being found among them. Detached patches of the same system of rocks occur in portions of the coast districts of Natal and in Swazieland.

Succeeding these sandstones and quartzites is a composite formation which has been a puzzling problem to many geologists, and whose true character cannot be said to be as yet clearly defined. On Dunn's geological map it is designated the "Dwyka Conglomerate," from its characteristic occurrence near the River Dwyka, in the Great Karoo. The peculiar feature of this conglomerate is that there are embedded in it fragments of rock derived from all the formations known in South Africa, such as granite, gneiss, quartz, jasper, porphyry, amygdaloid, limestone, schist, slate, shale, sandstone, and trap, and of sizes varying from that of a pin's head to blocks several feet square; the whole being set or fixed in an indurated and, in some instances, meta-

morphosed, muddy substance.* At localities hundreds of miles apart from each other the rock presents much the same uniformity of character and appearance. When weathered, its schistose structure bristles on the flats and mountains like inclined grave-stones; the old colonists name them "Bushmen stones" because the Bushmen hid among them in former days. Striking examples of this weathering are to be seen on the craggy hills approaching to the Matjesfontein Railway Station.

Mr. Dunn, in 1886, reported that he had traced the outcrop of this conglomerate from the Vaal River, near Kimberley, along the Vaal and Orange Rivers, passing Hope Town, then westwards towards Prieska, thence along the south-west of Doornberg and Ezelberg, and through a broad belt, twenty to forty miles across, known as the Kijenveld. From Lemoenfontein Pass, in Bushmanland, the belt bends southward, passing about twenty miles to the west of Calvinia. From this it becomes altered and involved in the plications of the enclosing strata. It afterwards continues on past Patats River, near Karoo Poort; thence in a double belt it runs nearly due east past Matjesfontein, Buffalo River, and Prince Albert and Willowmore, to Mount Stewart, on the Graaff Reinet Railway; north of Alicedale, on the Graham's Town Railway; north of Botha's Hill, and out to the sea at Goulana River-mouth. It reappears at St. John's River, crosses the Umzimkulu River, near the drift, passes to the east of Richmond in Natal, one belt passing Pietermaritzburg and Grey Town on to the junction of the Buffalo and Tugela Rivers, while another passes along the coast and shows at the Umgeni Quarry, near Durban.

Within the last year an outcrop of the same formation was found by Mr. T. Bain at Mafeking, on the border of British Bechuanaland, and it is, therefore, evident that its northern limit is much higher up than was supposed, and is still quite undefined. The rim of the basin embraced by the outcrop so observed is over 800 miles in length, with a mean breadth of 250 miles. It includes the greater portion of Cape Colony, the Orange Free State, and Natal, and a portion of the circuit still remains open, for geologists to work out and fill up.

The origin of this peculiar formation has been much debated. Mr. A. G. Bain considered it to be of igneous origin, and named it a "claystone porphyry." Mr. Wyley designated it a trap conglomerate. Dr. Sutherland, of Natal, thought it probably

* Professor Seeley says that the base of which the conglomerate is composed suggests that it has been dust of volcanic ash ejected from the earth into the air, and after being ejected into the air has fallen into water, and then consolidated, as with cement, the pebbles and boulders stretching on a vast seashore, assuming many of the characteristics of volcanic rock.

a "boulder clay," identified with ancient moraines, and akin to the Scandinavian drift. This supposition has been supported by Mr. Dunn, who found some of the small pebbles weathered out of the rocks at Matjesfontein and other places distinctly ice-scratched and grooved, and who also had discovered, about a mile north-west from the junction of the Orange and Vaal Rivers, a distinctly glacial surface, with the conglomerate resting upon it. Mr. Dunn was satisfied that the conglomerate of the northern portion of the colony, and that south of the Karoo, were one and the same rock, and came to the conclusion that the wide distribution of its varied and far-borne material was owing to its transport and deposition by glacier or iceberg agency.

The Dwyka or trap conglomerate is followed by a succession of shales and sandstones of immense thickness, which Mr. A. G. Bain named the lacustrine or reptiliferous beds, from the general uniformity and homogeneity of the deposits, and the fossil reptilian remains found in them. Mr. Wyley classed them as the equivalent of the English coal measures, dividing them into a series which he named in order of succession—(1) the Karoo shales, (2) the lower, (3) the middle, and (4) the upper coal measures; for, though coal was confined to the latter—the Stormberg rocks—he had met with fossil plants at varying levels of the formation.

In the course of investigations in search of coal in the Camdeboo and Nieuweld mountains in 1879, Mr. Dunn found that the lower Karoo beds were older, and quite unconformable to the upper Karoo beds. As there was a great gap in time separating them, he thought the relations of those rocks should be distinguished by different names, and, retaining for the upper series the old name of Karoo beds, he gave the name of Ecce beds to the lower, at the same time embracing in the group the Dwyka and other conglomerates, and the dark arenaceous shales next to them. He accordingly classed them in the following order of super-position:—

	Nature of Beds.	Fossils.	Thickness in feet.
Stormberg Beds.	Volcanic. Cave sandstone. Red and purple shale and sandstone. Coal, with grey shale and sandstone.	Fragments of reptilian bones. Nearly perfect ditto. Plants, ferns, and fossil wood.	2,510
Karoo Beds . .	Dark red, purple to grey, and light brown shales and sandstone.	Ferns in sandstone. Reptilian remains from base to summit, sili-cified wood and plant impressions in lower beds.	5,000

	Nature of Beds.	Fossils.	Thickness in feet.
Ecca Beds . .	Shales and sandstone.	Glossopteris and Calamites.	Unknown.
	Black shales with anthracite.		
	Brown and dark micaceous sandstone.		
	Black shales, nodule of anthraconite.		
	Dwyka conglomerate (several beds).		
	Dark arenaceous shales.		
	Beds below uncertain.		

Professor A. H. Green, now of Oxford, who visited the Cape in 1883, and made a special report to the Government on the coal deposits, confirmed the observations of Mr. Dunn as to the strong unconformity between the Ecca and the overlying horizontal Karoo beds. The Ecca series is well seen on the Queen's Road, between Graham's Town and Fort Beaufort. They extend in a succession of wavy folds to Calvinia on the west, to the Witteberg on the south, the Nieuweld and Camdeboo on the north, and eastward they stretch away past Aberdeen, Pearston, Koonap, and Fort Beaufort to the coast near East London.

The Karoo beds, which unconformably cover these Ecca beds, occupy a far more extensive area. Their southernmost boundary is Klipplaat, on the Graaff Reinet Railway, and twelve miles south of Wagonmakers Kraal, on the Beaufort line. Their western limit is the gneiss and crystallised limestone of Calvinia and Bushmanland, and from there they spread north past Hope Town to Kimberley, over the Orange Free State as far as Cronstadt; and eastward they are represented in Natal, near to Richmond, Pietermaritzburg, and Greytown. They repose on very different rocks at different localities. For quite five hundred miles on the south and south-west sides the floor is of Ecca beds; on the west, gneiss and old schistose rocks, crystalline limestone, etc.; in Griqualand West similar rocks; and in Natal on Ecca beds. At New Scotland, South African Republic, the Karoo beds are unrepresented, the Stormberg coal beds lying immediately on gneissose and schistose rocks.

The hills and mountains formed of these Karoo beds have a very characteristic aspect. They consist of alternations of horizontal sandstone and shale, with sometimes a capping of basalt, and when viewed from a distance their sides and precipices have a striking banded appearance, resulting from the unequal weathering of the hard and soft beds of which they are composed.

It is in the Karoo shales that the diamond-bearing pipes occur. At Bultfontein and Dutoitspan Mines the shale has not been bottomed, but it has a greater thickness there than at the more

northern mines of Kimberley and De Beers, whilst at the Vaal River Diggings it thins out altogether, thus confirming the supposition that the Kimberley Mines are situated at the northern rim of the saucer-shaped basin, which was once the great fresh-water lake of the Karoo area. Intrusive trap is met with among the shales, and underlying is an amygdaloidal trap or melaphyre—an exceedingly hard rock, with nodules of augite and quartz. Underneath this is a quartzite, and in the Kimberley Mine rock shaft, at a depth of 1,141 feet from the surface, the quartzite changes to metamorphic slates, interlaminated with thin layers of sandstone. This is the oldest rock that has so far been pierced.

The occurrence of small outcrops of anthracite coal of superior quality on the Nieuweld and Camdeboo Mountains, where the rocks had been faulted, taken together with the presence of the carbonaceous shales in the Kimberley mines, and at other parts of the Karoo basin defined by the rim of the "Dwyka conglomerate," led to the supposition that workable coal deposits might be found in the Ecce beds or the dark shales beneath the Karoo group, if they were thoroughly explored. Boring operations were therefore undertaken in 1887 at the northern side of the basin, beyond De Aar, but after reaching a depth of 700 feet they were discontinued, on account of the drill being on a dolerite dyke. At Kruidfontein, near Fraserburg Road, a bore hole of 1,200 feet was made; and at Camdeboo, in three successive stages, 2,400 feet was bored, but without result.

The only formation in the Cape Colony in which workable coal has as yet been found is the Stormberg rocks, which are classed as of the secondary, or Mesozoic epoch. They lie immediately and conformably on the top strata of the Karoo beds, and have a thickness of about 1,000 feet. They consist of coarse, grey quartzose grits passing into a conglomerate, and alternating with thin bands of shales and claystones, with which are intercalated the coal seams. Above this coal-bearing deposit—which is apparently the edge of the great coal basin extending to Natal, the South African Republic, and the Free State—are red and purple sandstones; and, covering them, is a massive bedded sandstone which, from the manner in which it has been affected by water and weathering, has been named the "cave sandstone." The scenery resulting therefrom is weird and picturesque, the rock forming craggy precipices, fantastically shaped masses, and detached monoliths. One of the caves is 360 feet wide at the mouth, 144 feet deep, 60 feet high at the entrance, and is said to be sufficiently large to hold 3,000 sheep. Similar caves are numerous along the edge of the sandstone. The top of these beds are composed of volcanic material.

A later division of the secondary period, *viz.*, the Jurassic or oolitic, is represented in the Cape Colony by the deposits along the course of the Sunday's River; while yet another division, the Cretaceous, has its equivalent in a deposit of small extent, rising from 60 to 100 feet above the sea-shore, near the Umtavuna River, in Alfred District, Natal. It is rich in fossils of ammonites and bivalves of great size and variety.

The tertiary and quaternary formations are represented in the clays, limestones, and sandstones found in the Zwartkops River Valley, Uitenhage, and portions of Alexandria and Bredasdorp Districts, the Cape Flats, and elsewhere. Drift deposits of pliocene, and probably post-pliocene, age are found at various places along the valleys of the Vaal and the Orange Rivers. In some localities, as at Hebron, Pniel, Hope Town, and Aries, towards the mouth of the river, these deposits are of great breadth and thickness. They consist of well-rounded boulders and pebbles of igneous rocks, amygdaloids, jasper, chalcedony, agate, etc., as well as garnets and diamonds.

These accumulations point to denuding agencies on a gigantic scale, such as may have been produced by the bursting of great lake basins, or the sudden upheaval of their beds, or perhaps a combination of both, the weight and velocity of the escaped waters forcing a way for themselves through the "poorts" or gaps of the coast barrier ranges, carrying along with them many thousands of feet of the yielding stratified rocks, and carving and moulding the surface features of the country into hills, valleys, and plains, as we now find them.

The evidences of volcanic activity at various remote periods of time are most abundant throughout South Africa. Along the south-western and north-western sides of the Karoo basin few dykes or eruptive trappean masses are met with; but in the midland, northern, and eastern parts of the Cape Colony, and adjacent states and territories, extensive developments of intrusive rock occur. These indicate that, after the deposit of the Karoo beds, and probably at the close of the period occupied in the accumulation of the Stormberg beds, vast masses of dolerite, in the form of dykes and lateral sheets, pierced through, or welled over the stratified rocks in all directions; and in many localities there is evidence even of the earlier intrusive matter being penetrated at all angles by newer dykes and flows. Except in limited areas, they do not seem to have greatly tilted or disturbed the strata, although, near the points of contact, they invariably indurated the sandstones and shales, and, spreading over their summit, gave them the doleritic capping which has markedly helped to preserve them from the effects of denuding and erosive forces.

In the Stormberg, where the hills attain a height of over 7,000 feet above sea-level, the dolerite flows seem to have been of great extent. Some of the sections there show a thickness of 400 feet of volcanic material, consisting of compact bedded lava, stratified ash, tuff conglomerate, amygdaloid (zeolite), and vesicular lava. In this tract traces of the former centres of eruptive activity are met with. Two of them still preserve a crater-like form—one is locally known as “Glat Kopjes,” and the other as “Telemachus Kop.” Mr. Dunn, in describing the latter, says:—“The kop, after which the farm is named, is a somewhat conical hill, rising 1,100 feet above the spruit at its base, and forms the southern lip of the old volcano. It is principally made up of extremely tough, heavy, doleritic rock. The rest of the crater is marked out by a circular range of low hills; the eastern side is particularly well defined. Right round the crater’s shell the rock appears to be of the same character as the kop, and is rudely columnar; but within the crater volcanic rocks, differing widely in colour and texture, and their mineral constituents, abound. Tuff conglomerate, containing pieces of very vesicular lava in abundance, mixed with many varieties of eruptive rock, is found on the east side of the basin, also on the outside of the west rim. Grey felspathic lavas occupy the lower central parts of the basin. On the north rim a dyke of dark, blue-black crystalline rock (of the same type as the most recent system of dykes) cuts through the other igneous rocks. Zeolitic amygdaloid is represented, and agate-bearing amygdaloid also. Huge masses of sandstone are enveloped in the igneous rock, and are invariably highly altered by heat. Only at a centre of volcanic activity could such a variety of igneous rocks be collected.” The agates and amygdaloids, which are *in situ* on the mountains of the Stormberg and its continuation, the Drakensberg, point to the source of the accumulations of pebbles which form the drift deposits along the great river-beds whose streams rise in that elevated range.

Subterranean caverns occur in the limestone formation at the base of the Zwarteberg Range in the district of Oudtshoorn, Cape Colony. These are known as the Cango Caves, and contain a series of very interesting vaults and grottoes decorated with stalactite and stalagmite formations in varied designs. Although persons have penetrated them for a distance of over a mile, they have never been explored to the end; and their inner recesses still remain as a field of adventure for anyone ambitious of going where man has never been before. They have been graphically described by Lieut. Shirwell, an Indian visitor, who explored them suitably provided with appliances for illuminating the

caverns, and who declared that Elephanta, and other caves of India, did not gratify him so much as these.

At Wonderfontein, near Potchefstroom, South African Republic, there are a series of caves and vast chambers, through which the Mooi River flows in a subterranean course. Mr. C. J. Alford says that these caves have been formed in calcareous quartzite by erosion, and that the veins of calcite dissolved have been redeposited in stalactitic formation. In the north-east of Mashonaland, Mr. F. C. Selous, a few years ago, discovered, in the Limestone caves at Sinoia's, a subterranean pool or lakelet, approached by underground passages and chambers with stalactite pillars. The lake is illuminated by the light refracted and internally reflected in the clear liquid water, producing, it is said, a cerulean tinge, like the famed Grotta Azzura of Capri.

The Palæontology, like the geology of South Africa, has only been partially investigated. Among the first collectors of fossils which threw some light on the distribution of extinct life over the country was Dr. Andrew Smith, whose specimens were submitted to Sir R. Murchison, and referred to in his work on the Silurian system. The next was Mr. A. G. Bain, whose collections of the Palæozoic series were examined and described in 1856 by Mr. Sharpe, President of the Geological Society, and Mr. J. W. Salter. Since that time there have been many explorers and collectors—foremost amongst them being Dr. Atherstone, Dr. Sutherland and Mr. T. Bain, Mr. Orpen, Mr. H. W. Piers, Mr. Brown, Dr. Berry, and Dr. Kannemeyer—several of whose specimens have found a place in the museums of the colony, as well as of Europe.

Some interest attaches to the ancient flora associated with the coal measures. Fossil specimens of *Lepidodendra* were found by Mr. Wyley in 1856 in a quarry near to Riversdale, and at a later period by Mr. T. Bain and Dr. Atherstone in the Witteberg or Klein Zwarteborgen, as well as in Albany. Again, in 1878, Mr. Dunn found in the shales of the Camdeboo Mountains impressions of *Glossopteris Browniana* and *Calamites*. These plants undoubtedly flourished in the Devonian and carboniferous subdivision of the Palæozoic period, and their organic remains are identified with what are known as the true coal measures in Europe, America, and Australia; but no coal-bearing strata of this age has as yet been unfolded in South Africa.

The Stormberg coal measures belong to a higher and newer geological horizon. The occurrence of *Pecopteris*, *Tæniopteris*, *Sphenopteris*, and other species of ferns, as well as the fossil fauna found in the underlying rocks, identify them with the carbonaceous formation of the Mesozoic period. Both the flora

and fauna find their analogies in India and Australasia, where somewhat similar deposits of coal, with a large proportion of ash, are worked. Silicified wood, fossil stumps, and fragments of trunks and branches of trees, evidencing the forest growth which existed during this period, extend northward through Basutoland and over a portion of the south-eastern side of the at present treeless Orange Free State. And in the sandstones above them, around Winberg, Senekal, and its neighbourhood, numerous specimens are met with of fossil fish, identified as gaunoids of the early Mesozoic group.

Mr. A. R. Sawyer, however, has recently reported that in the coal basin, resting on the sandstones and quartzites around Vereeniging, near to the junction of the Vaal and the Klip rivers, in the Orange Free State (about thirty-five miles south of Johannesburg), he has come across two fossils of *Lepidodendron* and one of *Favularia*, which leave no doubt on his mind that the rocks within that area are of the Palæozoic carboniferous formation. The fossils have been verified by Professor Wilkinson, of Owen's College. In South Africa, as in Queensland and New South Wales, the coal measures may be proved, by further research, to belong to distinct geological periods.

The special division of South African palæontology, which has as yet been carefully worked up, is the rich fossil fauna found in the Karoo beds. Numerous specimens of the organic remains of this old world reptilian vertebrate life have been sent to England, where they have been extracted from the matrix and elucidated by such eminent men as the late Sir Richard Owen, Professor Huxley, and Professor G. H. Seeley. A descriptive and illustrated catalogue of the leading types, prepared by Sir Richard Owen, was published in 1876, by the trustees of the British Museum, and since then considerable additions to the list have been made.

The specimens developed furnish conclusive evidence to the anatomist that these extinct saurians—now feebly represented by the lizards and alligators—were grand in bulk, numerous in individuals, and most varied in species; and their form and structure showed that they were endowed with kinds and powers of locomotion, and with instruments for obtaining and dealing with vegetable and animal food, which have been continued and advanced through higher forms of vertebrates. One of them, named the *Pariasaurus Bainii* (after Mr. T. Bain), was recently restored under the supervision of Professor G. H. Seeley. The limbs of the animal indicate that it was more terrestrial than aquatic. It was common to that part of the country known as the "Gouph," between Prince Albert Road Station and the Nieuweld

Mountains. Its bones were found, complete in all their parts, near the Fraserburg Road Station, and have been developed, as here shown.

Another species, the *Dicynodonts*, had a skull as large as that of an ox, and two tusk-like teeth external to the lower jaw. The *Oudenodonts* had no teeth, but one of them in its physiognomy must have resembled an owl, with its horny beak curving downwards and backwards, and to this may have been added a pair of tusks descending vertically, as in the walrus. The *Theriodonts*, a very numerous family, had incisors, canines, and molars, the nipping teeth of carnivorous animals; and one species, in addition to this dentition and an associated humeral structure, afforded evidence of a bony formation of the forepaw, exemplifying an advance towards the mammalian type of a later period of time.

As to the age of these reptilia, Sir Richard Owen came to the



PARIASAU'RUS BAINII.

conclusion, from the evidence before him, that they were not later in time than the Trias, and probably lived in the Palæozoic period, at or near to a lake basin of the ancient continent which exceeded in extent Tanganyika or any of the inland fresh-water seas discovered by explorers.

The mineral resources of South Africa are known to be varied and extensive. With the single exception of the copper ores of Namaqualand, which have been continuously worked since 1852, the stores of native metals and carbonaceous minerals existing over its wide, and in many parts untrodden area, remained undisclosed and undeveloped until about twenty-five years ago. The accidental discovery of diamonds in 1867 gave the first stimulus to prospecting and research; and since then discovery after discovery has rewarded exploration, until now it is recognised that if the country is not the actual "Ophir" of King

Solomon's days, it has a claim to rank, in respect to mineral wealth, with some of the most favoured parts of the world.

Gold, diamonds, copper, silver, lead, and coal are the principal minerals of economic value at present mined. The important industries connected with most of these are dealt with elsewhere in this volume. It is only necessary here to refer briefly to the mode of occurrence of some of these products and to enumerate others worthy of notice.

Native gold has been proved to exist in several parts of the Cape Colony; but nowhere has it as yet been found in paying quantities. In the Knysna district it occurs among the quartz reefs in the clayslates, schists and sandstone, as well as in alluvial drifts. Between 1887 and 1891 a considerable amount of capital was expended by companies and individuals in developing and testing the auriferous area around Millwood, extending from the Karatara to the Homtini Rivers. During this period a total of over 2100 ozs. of gold was registered as won; but this was not sufficient to inspire hope or encourage more extensive workings. The development, carried out to a depth of over seventy feet, only proved the poverty of the reefs underground. The alluvial near the bed rock and at the bends of the rivers, worked by sinking pits and sluicing in a rough and ready way, was in some instances fairly payable. Two claims yielded 14 lbs. of gold in seven months' irregular working with ten labourers. Other portions produced little more than a few specks of gold. The average amount the alluvial yielded was about 8 grains per cubic foot of wash—a return not sufficiently remunerative.

In 1891, gold was discovered in the district of Prince Albert, at two farms named Spreeuwfontein and Waterfal, in the Gough, a locality where some twenty years before a nugget of 2 ozs. 3 dwts. had been picked up by a cattleherd. The gold was found chiefly as alluvial in the crevices of the shales and sandstones, traversed by thin veins or reefs of quartz, forming the bed rocks of the creeks and rivers. In some instances the hard matrix in which the saurian fossils common to the locality are found were incrustated with cubes of iron pyrites carrying visible gold. From August to December over 500 ounces were collected, including a number of small nuggets; but after a time digging was discontinued, it being found of an unpayable character.

In 1892, alluvial gold of similar nugget form to that of Prince Albert was found near Kaboos, situate in the Richterveld, at the north-west corner of Namaqualand. This tract had been prospected twenty years previously by Mr. Dunn, who reported having found traces of gold at various spots from Stinkfontein towards

Missionary's Drift, on the Orange River. The formation is granite, gneiss, and quartz, with schists, sandstone and conglomerates, crossed by dykes of greenstone. This part of the country being extremely arid and void of food supplies, has as yet offered no attraction to the prospector.

Gold has also been found in pockets of prehnite varying from two to four feet in thickness, occurring in the igneous dykes near Cradock, and supposed to be derived from the sub-aerial decomposition of the surrounding dolerite rocks. At Laakenvley and Karoopoort, in the Ceres district, numerous quartz reefs occur which have been prospected and yield small grains of the metal in many places.

In Natal, gold has been found in the quartzose veins which traverse the gneiss of the Umzinto district, and also at the junction of the Tugela and Buffalo River in Umsinga district, and in Zululand. In the South African Republic, gold-mining over a wide area is carried on with very marked success, as is shewn in another chapter. In Mashonaland a gold-bearing formation of great extent has been proved, and its development is now in course of progress.

Cinnabar has been discovered near Zeerust, and east of Barberton, in the South African Republic; and native quicksilver has been reported from the neighbourhood of Daniel's Kuil, Griqualand West.

Coal exists over an area of about 56,000 square miles, embracing parts of the Cape Colony, the Free State, the South African Republic and Natal. Lignite occurs on the Cape Flats, and in the bed of the Oliphant's River, Oudtshoorn. As yet no trace of mineral oils has been met with.

Copper mines, as already stated, have been worked in Namaqualand for forty years past. They are in the hands of two English companies—the Cape Copper Mining Company and the Namaqua Mining Company. A total quantity of about 500,000 tons has been exported, and the annual production now is over 30,000 tons with a percentage of 27½ at Ookiep. The ores—comprising silicates, carbonates, oxides and sulphurets—occur in distinctive lodes of intrusive felspathic rock, chiefly in the gneiss and schists. Ookiep, belonging to the Cape Copper Mining Company, is the principal mine; its shaft has reached a depth of 117 fathoms in ore-bearing rock. Copper deposits are found in several other parts of Namaqualand as well as in Damaraland, where at one time the Matchless mine was worked by the Walwich Bay Mining Company, and at Otave there is an extensive outcrop, honey-combed with shallow pits, where the native Bushmen extracted the surface ore. In the South African Republic similar formations

exist, and near the Rooiberg, and at the Polabora there are ancient workings, showing that copper was mined there in remote times. Copper indications occur in Natal, in the county of Durban, and in the Tugela Valley. They are also found in the higher parts of Eastern Pondoland and in the Zuurberg, near Mount Ayliff.

Argentiferous galena has been found at Van Staden's River, about twenty miles from Port Elizabeth, but so irregularly and sparsely disseminated as to give no hope of remunerative working. In Hope Town, Calvinia, St. John's River, and Tembuland it has also been met with. In the South African Republic it is of frequent occurrence, and in the district of Marico lead mines were worked with some success for a time. Near to Pretoria and Middelburg there appear to be true fissure lodes in the granite carrying massive seams of argentiferous copper and galena, which give promise of a rich yield of silver ore. These will be found described in another chapter.

Iron ores are widely distributed. There are several varieties—magnetite, red iron ore, specular and hematite—in the Cape Colony, Free State, and Natal. In the South African Republic they are very abundant, occurring sometimes in almost pure masses—such as the Yzerberg, near Eersteling; and in Leydenburg and Zoutpansberg districts the ore is forged by the natives into weapons and other articles. Iron pyrites is found in all directions, and some from the Orange Free State has proved to be auriferous.

Of Manganese ores there are five varieties, pyrolusite (Manganese di-oxide), polianite, psilomelane, wad (manganese hydrate), and rhodonite, known as silicate of manganese, all of which are to be found in the Drakenstein Mountains, near Du Toits Kloof, the Cape district, and in Tembuland, Griqualand West, and the South African Republic.

Antimony ores, both the grey and plumosite, and also zinc, occur in Namaqualand, Zeerust, and at the Maitland Mines. Tin has been found in the granitic formation 60 miles east of Lake Chrissie.

Cobalt and nickel have been worked on the Oliphants River in the district of Middelburg, South African Republic. From 1876 to 1879 about 67 tons of cobalt were exported through Natal.

In regard to earthy minerals, the country is rich in all descriptions. There is, of quartz (silicate dioxide), rock crystal, rose quartz, citrine, common quartz, and chalcedony; of felspar orthoclase, oligoclase, and periclase; of mica, phengite and biotite. There is also chabasite, prehnite, kaolin, hornblende, asbestos, crocidolite, augite, olivine, iolite, tourmaline, garnet, cyanite, corundum (emery), and beryl. Agates, in the Vaal and

Orange Rivers, are of many colours and shades. Garnets, both red and green, are also found there, some in rounded forms, rivalling the ruby in colour. Crocidolite, a remarkably handsome, ornamental stone, occurs in Griqualand West, and also south of the Orange River; it is now being largely worked up into jewellery, and is specially susceptible of artistic effect on account of the variety of shades and colours in which it is found.

The saline minerals are—common salt, soda, nitre, alum, and calcspar. There are extensive salt-pans in the Cape Colony, Bechuanaland, Orange Free State, and the South African Republic. These are in the form of basin-shaped depressions, occurring in different formations, such as the Karoo shale, gneiss, and granite; and, near Port Elizabeth, in the secondary beds. They contain deposits of saline matter, covered with a stratum of silt. The saline matter (chloride of sodium) is dissolved by the rains, and, when re-deposited by evaporation, is scraped off and gathered. Large quantities are annually collected and sent to market, the estimated annual value of the produce of the Cape Colony alone being over £20,000. At some places the salt is raised and evaporated in artificially heated pans, thereby securing an increased and constant supply. The largest production in Cape Colony is from the Uitenhage salt-pan, where as much as 100,000 bushels per annum have been taken out. Malmesbury, Cradock, Port Elizabeth, and Herbert salt-pans come next. In Calvinia and Namaqualand some of the salt-pans are several miles in circumference. Those in Bechuanaland and Zoutpansberg are also of considerable area. A short distance north of Pretoria a pan occurs in a granite basin of cone shape, the saline deposit in its centre covering about 400,000 square yards.

Deposits of nitre have recently been discovered near the banks of the Orange River, between Prieska and Upington, which are likely to develop into an important industry. Nitre has also been found in small quantities associated with doleritic masses in clefts and crevices of the Nieuweld Mountains.

Sulphur has been obtained in the Nieuweld Range, south-west of Fraserburg, and also on the Cape Flats, the deposits supposed to be from exhausted springs.

Beds of limestone and marl are found in several of the western districts of the Cape Colony, and crusts of calcareous tufa overlie the Karoo plains all over the inland districts. Near Saron, in the district of Tulbagh, there is a magnesia limestone suitable for hydraulic cement. In the Karoo shales, and especially in the red beds, lines of nodular concretions (septaria) abound. Those that have weathered out are strewn over the surface of the ground,

and attract notice from their peculiar markings and forms. An analysis of the septaria by Dr. Hahn gives the following result :—

Silicate of alumina, Potash, and Soda	...	18·4	per cent.
Carbonate of lime	... ..	76·4	„
Ditto iron	... ..	4·3	„
Ditto magnesia	... ..	·3	„
Water	... ..	·6	„

Marble of mottled colour is met with at Schooman's Hook, Oudtshoorn, at Vogelvlei, Tulbagh, Worcester, Swellendam, Namaqualand, and at Troe Troe in the Van Rhyn's Dorp district. In Natal, near the Umzimkulu River, there is a very handsome crystalline white marble, forming a mass extending over thirty square miles, and 1,000 feet thick. In the South African Republic, besides tufaceous limestone, there are extensive beds of dolomite, and a calcareous quartzite which yields lime on calcination. Cement works have been established near Pretoria.

There are abundant supplies of building stone everywhere. The Paarl granite, utilised for the basement of the Cape Parliament Houses, as well as for the graving dock, Table Bay, is especially fine-grained and handsome. Sandstones and freestones are abundant, and those used in the building of the Oudtshoorn and Cradock churches, the Raadzaal at Bloemfontein, and the State offices at Pretoria, show that they are a beautiful and durable material. There are also sandstones and grits suitable for mill and grindstones. Clays, adapted for every purpose, from the manufacture of the finest pottery to tiles and bricks, are very extensively met with.

Mineral springs—sulphur, chalybeate, and thermal—are distributed over many parts of the Cape Colony. All of them are considered to possess more or less of curative power in chronic cases of rheumatic and cutaneous diseases. The chief sulphur springs are at Malmesbury, Fraserburg, Graaff Reinet, Hanover, Colesberg, Cradock, Fort Beaufort, Willowmore, Aliwal North, and St. John's River. The thermal springs include the remarkable Brandvlei (fire lake), near Worcester, where the water, at a temperature of 145°, wells out from the ground over a space of about 300 yards long by ten broad. In the same district is the spring of Goudini, and in the adjoining district of Robertson, that of Montagu, which is much frequented. At the Oliphant's River, near Clanwilliam district; at Woolfkrakal, Oudtshoorn district; at Toverwatirsport; and at Balmoral and Sandfontein, in the Uitenhage district, there are similar thermal springs.

The chalybeate springs near Caledon are a favourite resort.

They are both chalybeate and thermal, having a temperature of 110°. Dr. Hahn's analysis of the Caledon water is as follows:

Ferrous carbonate	...	...	2·100	grains per gall.
Sodic sulphate	...	...	·862	" "
Common salt	...	...	4·027	" "
Silica	...	...	1·802	" "
Alumina	·756	" "
Calcic sulphate	1·624	" "
Calcic carbonate	(trace)	" "
Magnesian sulphate	1·054	" "
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				12·225

The principal and valuable constituent is ferrous carbonate, which is present in the water as bicarbonate. On exposure to the air this changes into yellowish-brown insoluble basic ferric carbonate, which soon turns into the mineral limonite, which also forms the hard, solid ironstone of the hill in which the springs are. The water, when freely used as it comes from the spring, contains the iron in a condition in which it is most readily absorbed into the system.

Sulphur and thermal springs occur also in the South African Republic. One of them, named the "Warm Bad," situate between Pretoria and Nylstrom, is much frequented, especially by the Boers, who form encampments with their tents and waggons in considerable numbers around the spring. Lithium forms one of the constituents of the water. An analysis made by Dr. Hahn shows that a gallon contains in solution:—

Carbonate of soda	...	...	16·84	grains.
Common salt	...	...	9·168	"
Carbonate of lithium	...	...	·12	"
Carbonate of lime	...	...	1·82	"
Iron	...	...	·29	"
Sulphur of magnesia	...	...	·36	"
Silica	...	...	2·45	"

A series of geological and mineralogical specimens of the rocks of South Africa, collected by Dr. P. D. Hahn, Professor of Chemistry in the South African College, has been placed in the Cape Court, at the World's Fair, Chicago.

CHAPTER III.

THE SOUTH-AFRICAN VERTEBRATE FAUNA.*

BY ROLAND TRIMEN, F.R.S., ETC.,

Curator of the South-African Museum, Cape Town.

WHEN on the map we look at the huge African Contine lying, unlike the other three great land-masses of the globe wholly in tropical and warm-temperate latitudes, and unbroken by either spaces of sea or continuous ranges of lofty mountains it would be natural to expect much uniformity in its fauna and flora. There are apparently no insurmountable physical barriers and no extreme climatal differences, to hinder the free range and dispersal of either animals or plants; and it seems reasonable to suppose that not only the broad tropical belts on either side of the equator, but also the warm-temperate extremities and almost corresponding Northern and Southern latitudes, would be inhabited by much the same organic forms.

In Africa itself, however, it is found that no such sameness of physical conditions exists; the main element of disturbance consisting in an immense desert tract, which occupies the broadest portion of the northern half, and stretches from the Atlantic to the Red Sea, and from near Lake Tchad in Lat. 1° to the Atlas Range in 33°. This enormous arid region, whose area is roughly estimated as about one-third of that of the whole continent (or about equal to all Europe excluding Scandinavia) constitutes an absolute barrier to inter-communication as regards the vast majority of living things native to tracts situated respectively to the north and to the south of it; and it is found accordingly that only a very small number of forms inhabit alike the countries adjoining the Sahara on its northern and

* The proposal that I should contribute a short account of South-African Zoology to this "Hand-Book" has been to me the source of some perplexity. I had a sincere desire to comply with the request, but have found it most difficult, with the best endeavours, to do so with any satisfaction within the limits of the few pages available. After many futile attempts to compress so great a subject into such narrow bounds, I have been compelled to abandon the larger part of it, and, to the Invertebrate animals, and confine this sketch to the Vertebrate only. Even this limited subject is unmanageably big; at one turn one has to condense to baldness or to omit altogether; with the result that what at the outset looked a somewhat promising memoir is reduced to the barest outline.—R. T.

southern borders, although a larger proportion penetrates the great desert region to varying depths. In the central parts of the Sahara the scanty fauna and flora are apparently in the main derived from the immigrant species, adapted to its abnormal conditions.

Whether the existing Sahara represents the site of one or more ancient seas or not, it seems unquestionable that by far the greater part gives evidence of unbroken aerial exposure for a very extended period; so that, either as desert or sea, its prolonged existence has been an impassable barrier between temperate North Africa and the more southern regions. It is this condition of things which accounts for the fact that temperate North and South Africa are altogether unlike in their native animals and plants; the former being inseparable, from a natural history standpoint, from Southern Europe, while the latter is emphatically part and parcel of the "Ethiopian" region, or Africa proper.

In briefly considering, therefore, the salient features of animal life in South Africa, it must be borne in mind that they agree, in the main, with those presented by the great inter-tropical area—in fact that, taking such larger zoological groups as "families," there is but little difference, while in genera and species South Africa exhibits a fair amount of divergence.

There is an admitted difficulty, in the absence of any well-marked natural boundary, in deciding what should be considered as the northern limit of South Africa. Wallace, in 1876, thought that the Kalahari Desert and the Limpopo River constituted perhaps the best boundary of his "South-African Sub-Region;" but he also included a considerable northward extension along the coast belt as far as Mozambique. Bowdler Sharpe, in 1884, on ornithological grounds, made South Africa extend not only to the Zambesi, but, on the western side, as far north as the River Quanza, thus including nearly the whole of Angola; while Heilprin, in 1887, did not hold the extra-tropical tract sufficiently pronounced in its zoological features to warrant its separation from his great "East-Central Sub-Region," which otherwise agrees with Wallace's "East-African" one. It will be found that the more the boundary adopted encroaches on the tropical area, so in proportion does it become more difficult to distinguish the Southern from the general Ethiopian fauna; and I have on this account for many years taken the Tropic of Capricorn as the most convenient limit. This boundary, although an arbitrary one, has the great advantage of being recognisable at a glance, and intelligible to every one, defining *South Africa* as that part of the continent which lies to the south outside the great tropical area.

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The main features of the higher vertebrate life of Africa proper are well known. They consist, as regards mammals, in the striking development of the higher monkeys, including two—gorilla and chimpanzee—of the three existing apes nearest to man; the unequalled number and variety of antelopes; the prevalence of both large and small carnivora, including several peculiar genera; the exclusive possession of such now isolated forms as the hyraces, the giraffe, two hippopotami, and the aardvaark; and the existence of a species of elephant and two species of rhinoceros peculiar to the region; while the golden mole, jumping shrews, zorilla, the suricate and other viverrines, the zebras and the wart-hogs, are all specially characteristic of the continent. These notable features are emphasized by the total absence of such prominent other Old-World groups of animals as deer, goats and sheep, camels, and bears.

The absolutely peculiar Ethiopian groups of birds are the plain-eaters, colies, wood-hoopoes, and secretary; but other of marked development are the weaver-finches, starlings, shrike, sun-birds, barbets, cuckoos, rollers, bee-eaters, honey-guides, and hornbills. Very prevalent also are the vultures, eagles, and hawks; the fly-catchers, warblers, fruit-thrushes, and larks, the guinea-fowls and francolin partridges, and the bustards. On the other hand, Africa is apparently very poor in parrots, and poor in pigeons, and in woodpeckers is no richer than the Palæarctic Region.

It is with less knowledge at disposal that the Ethiopian reptile, amphibians, and freshwater fishes can be discussed; these vertebrate classes having received comparatively little attention from both collectors and zoologists, and the region having as yet been most imperfectly explored as far as they are concerned. As regards reptiles, the tortoises are moderately numerous, the typical genus *Testudo* being well represented in the south; there are four crocodiles, including a genus peculiar to Madagascar; lizards number not far from 300 known species, three of the families being absolutely peculiar, and those of the skink, geckos, amphisbænians and chameleons, especially numerous and characteristic; and among the rather limited number of snakes are specially noticeable four boas, a considerable series of venomous colubrine forms (*Elapinae*), a peculiar sub-family of egg-swallowers (*Dasyeltinae*), and the most formidable of known vipers.

The Amphibians or Batrachians consist almost entirely of the higher order (*Salientia*), no newts or salamanders having been discovered, and only a few of the legless burrowing groups of coecilians occurring. Three-fourths of the frogs and toads belong

to the family *Ranidæ*, only eight species of *Bufo* being recorded. The most remarkable and peculiar family is that of the clawed and tongueless *Dactylethridæ*, which, with the extraordinary *Pipa* of South America, constitute a distinct sub-order.

Among the Freshwater Fishes are especially prominent the Cat-fishes (*Siluridæ*); the curious *Mormyridæ*, peculiar to Africa; and the Carp and Barbel family (*Cyprinidæ*); all belonging to the order Physostomi, in each of which from fifty to sixty species are known. Next in number are the *Characinidæ*, appertaining to the same order, and containing a very large proportion of peculiar forms, including the formidable species of *Hydrocyon*, whose teeth are exposed and interlocking like a crocodile's. In the order Acanthopterygii the only well-represented family is that of the *Chromides*—perch-like fishes, of which there are three peculiar Ethiopian genera; but the few *Labyrinthici* are very remarkable, being closely allied to the Indian "climbing perch," and like it possessing an accessory breathing organ enabling them to live for some time out of the water. The now almost extinct order of Ganoids, so numerous in palæozoic and mesozoic formations, has three African representatives; of which the most striking is the well-known *Protopterus*, of the sub-order *Dipnoi*, distinguished by the possession of both lung and gills.

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and attract notice from their peculiar markings and forms. An analysis of the septaria by Dr. Hahn gives the following result :—

Silicate of alumina, Potash, and Soda	...	18·4	per cent.
Carbonate of lime	... ..	76·4	„
Ditto iron	... ..	4·3	„
Ditto magnesia	... ..	·3	„
Water	... ..	·6	„

Marble of mottled colour is met with at Schooman's Hook, Oudtshoorn, at Vogelvlei, Tulbagh, Worcester, Swellendam, Namaqualand, and at Troe Troe in the Van Rhyn's Dorp district. In Natal, near the Umzinkulu River, there is a very handsome crystalline white marble, forming a mass extending over thirty square miles, and 1,000 feet thick. In the South African Republic, besides tufaceous limestone, there are extensive beds of dolomite, and a calcareous quartzite which yields lime on calcination. Cement works have been established near Pretoria.

There are abundant supplies of building stone everywhere. The Paarl granite, utilised for the basement of the Cape Parliament Houses, as well as for the graving dock, Table Bay, is especially fine-grained and handsome. Sandstones and freestones are abundant, and those used in the building of the Oudtshoorn and Cradock churches, the Raadzaal at Bloemfontein, and the State offices at Pretoria, show that they are a beautiful and durable material. There are also sandstones and grits suitable for mill and grindstones. Clays, adapted for every purpose, from the manufacture of the finest pottery to tiles and bricks, are very extensively met with.

Mineral springs—sulphur, chalybeate, and thermal—are distributed over many parts of the Cape Colony. All of them are considered to possess more or less of curative power in chronic cases of rheumatic and cutaneous diseases. The chief sulphur springs are at Malmesbury, Fraserburg, Graaff Reinet, Hanover, Colesberg, Cradock, Fort Beaufort, Willowmore, Aliwal North, and St. John's River. The thermal springs include the remarkable Brandvlei (fire lake), near Worcester, where the water, at a temperature of 145°, wells out from the ground over a space of about 300 yards long by ten broad. In the same district is the spring of Goudini, and in the adjoining district of Robertson, that of Montagu, which is much frequented. At the Oliphant's River, near Clanwilliam district; at Woolfkraal, Oudtshoorn district; at Toverwatirsport; and at Balmoral and Sandfontein, in the Uitenhage district, there are similar thermal springs.

The chalybeate springs near Caledon are a favourite resort.

They are both chalybeate and thermal, having a temperature of 110°. Dr. Hahn's analysis of the Caledon water is as follows:

Ferrous carbonate	...	...	2.100	grains	per gall.
Sodic sulphate	...	...	.862	"	"
Common salt	...	...	4.027	"	"
Silica	...	...	1.802	"	"
Alumina	...	...	.756	"	"
Calcic sulphate	...	...	1.624	"	"
Calcic carbonate	...	...	(trace)		
Magnesian sulphate	...	...	1.054	"	"
			<hr/>		
			12.225		

The principal and valuable constituent is ferrous carbonate, which is present in the water as bicarbonate. On exposure to the air this changes into yellowish-brown insoluble basic ferric carbonate, which soon turns into the mineral limonite, which also forms the hard, solid ironstone of the hill in which the springs are. The water, when freely used as it comes from the spring, contains the iron in a condition in which it is most readily absorbed into the system.

Sulphur and thermal springs occur also in the South African Republic. One of them, named the "Warm Bad," situate between Pretoria and Nylstrom, is much frequented, especially by the Boers, who form encampments with their tents and waggons in considerable numbers around the spring. Lithium forms one of the constituents of the water. An analysis made by Dr. Hahn shows that a gallon contains in solution:—

Carbonate of soda	...	...	16.84	grains.
Common salt	...	...	9.168	"
Carbonate of lithium	...	...	.12	"
Carbonate of lime	...	...	1.82	"
Iron	...	...	.29	"
Sulphur of magnesia	...	...	.36	"
Silica	...	...	2.45	"

A series of geological and mineralogical specimens of the rocks of South Africa, collected by Dr. P. D. Hahn, Professor of Chemistry in the South African College, has been placed in the Cape Court, at the World's Fair, Chicago.

CHAPTER III.

THE SOUTH-AFRICAN VERTEBRATE FAUNA.*

BY ROLAND TRIMEN, F.R.S., ETC.,

Curator of the South-African Museum, Cape Town.

WHEN on the map we look at the huge African Contine lying, unlike the other three great land-masses of the globe wholly in tropical and warm-temperate latitudes, and unbroken by either spaces of sea or continuous ranges of lofty mountains it would be natural to expect much uniformity in its fauna and flora. There are apparently no insurmountable physical barriers and no extreme climatal differences, to hinder the free range and dispersal of either animals or plants; and it seems reasonable to suppose that not only the broad tropical belts on either side of the equator, but also the warm-temperate extremities unbroken almost corresponding Northern and Southern latitudes, would be inhabited by much the same organic forms.

In Africa itself, however, it is found that no such sameness of physical conditions exists; the main element of disturbance consisting in an immense desert tract, which occupies the broadest portion of the northern half, and stretches from the Atlantic to the Red Sea, and from near Lake Tchad in Lat. 1° to the Atlas Range in 33°. This enormous arid region, which area is roughly estimated as about one-third of that of the whole continent (or about equal to all Europe excluding Scandinavia) constitutes an absolute barrier to inter-communication as regards the vast majority of living things native to tracts situated respectively to the north and to the south of it; and it is accordingly that only a very small number of forms inhabit alike the countries adjoining the Sahara on its northern and

* The proposal that I should contribute a short account of South-African Zoology to this "Hand-Book" has been to me the source of some perplexity. I had a sincere desire to comply with the request, but have found it most difficult, with the best endeavours, to do so with any satisfaction within the limits of the few pages available. After many futile attempts to compress so great a subject into such narrow bounds, I have been compelled to abandon the larger part of it, *vid.*, the Invertebrate animals, and to confine this sketch to the Vertebrata only. Even thus limited the subject is unmanageably big; as it turns out one has to condense or to omit altogether; with the result that what at the outset is a somewhat promising memoir is reduced to the barest outline.—R. T.

southern borders, although a larger proportion penetrates the great desert region to varying depths. In the central parts of the Sahara the scanty fauna and flora are apparently in the main derived from the immigrant species, adapted to its abnormal conditions.

Whether the existing Sahara represents the site of one or more ancient seas or not, it seems unquestionable that by far the greater part gives evidence of unbroken aerial exposure for a very extended period; so that, either as desert or sea, its prolonged existence has been an impassable barrier between temperate North Africa and the more southern regions. It is this condition of things which accounts for the fact that temperate North and South Africa are altogether unlike in their native animals and plants; the former being inseparable, from a natural history standpoint, from Southern Europe, while the latter is emphatically part and parcel of the "Ethiopian" region, or Africa proper.

In briefly considering, therefore, the salient features of animal life in South Africa, it must be borne in mind that they agree, in the main, with those presented by the great inter-tropical area—in fact that, taking such larger zoological groups as "families," there is but little difference, while in genera and species South Africa exhibits a fair amount of divergence.

There is an admitted difficulty, in the absence of any well-marked natural boundary, in deciding what should be considered as the northern limit of South Africa. Wallace, in 1876, thought that the Kalahari Desert and the Limpopo River constituted perhaps the best boundary of his "South-African Sub-Region;" but he also included a considerable northward extension along the coast belt as far as Mozambique. Bowdler Sharpe, in 1884, on ornithological grounds, made South Africa extend not only to the Zambesi, but, on the western side, as far north as the River Quanza, thus including nearly the whole of Angola; while Heilprin, in 1887, did not hold the extra-tropical tract sufficiently pronounced in its zoological features to warrant its separation from his great "East-Central Sub-Region," which otherwise agrees with Wallace's "East-African" one. It will be found that the more the boundary adopted encroaches on the tropical area, so in proportion does it become more difficult to distinguish the Southern from the general Ethiopian fauna; and I have on this account for many years taken the Tropic of Capricorn as the most convenient limit. This boundary, although an arbitrary one, has the great advantage of being recognizable at a glance, and intelligible to every one, defining *South Africa* as that part of the continent which lies to the south outside the great tropical area.

The main features of the higher vertebrate life of Africa proper are well known. They consist, as regards mammals, in the striking development of the higher monkeys, including two—gorilla and chimpanzee—of the three existing apes nearest to man; the unequalled number and variety of antelopes; the prevalence of both large and small carnivora, including several peculiar genera; the exclusive possession of such now isolated forms as the hyraces, the giraffe, two hippopotami, and the aardvaark and the existence of a species of elephant and two species of rhinoceros peculiar to the region; while the golden mole, jumping shrews, zorilla, the suricate and other viverrines, the zebras and the wart-hogs, are all specially characteristic of the continent. These notable features are emphasized by the total absence of such prominent other Old-World groups of animals as deer, goats and sheep, camels, and bears.

The absolutely peculiar Ethiopian groups of birds are the plain-eaters, colies, wood-hoopoes, and secretary; but others of marked development are the weaver-finches, starlings, shrike, sun-birds, barbets, cuckoos, rollers, bee-eaters, honey-guides, and hornbills. Very prevalent also are the vultures, eagles, and hawks; the fly-catchers, warblers, fruit-thrushes, and larks, the guinea-fowls and francolin partridges, and the bustards. On the other hand, Africa is apparently very poor in parrots, and poor in pigeons, and in woodpeckers is no richer than the Palearctic Region.

It is with less knowledge at disposal that the Ethiopian reptile, amphibians, and freshwater fishes can be discussed; these vertebrate classes having received comparatively little attention from both collectors and zoologists, and the region having as yet been most imperfectly explored as far as they are concerned. As regards reptiles, the tortoises are moderately numerous, the typical genus *Testudo* being well represented in the south; there are four crocodiles, including a genus peculiar to Madagascar; lizards number not far from 300 known species, three of the families being absolutely peculiar, and those of the skink, geckos, amphisbæniids and chameleons, especially numerous and characteristic; and among the rather limited number of snakes are specially noticeable four boas, a considerable series of venomous colubrine forms (*Elapinae*), a peculiar sub-family of egg-swallowers (*Dasypeltinae*), and the most formidable of known vipers.

The Amphibians or Batrachians consist almost entirely of the higher order (*Salientia*), no newts or salamanders having been discovered, and only a few of the legless burrowing groups of caecilians occurring. Three-fourths of the frogs and toads belong

to the family *Ranidæ*, only eight species of *Bufo* being recorded. The most remarkable and peculiar family is that of the clawed and tongueless *Dactylethridæ*, which, with the extraordinary *Pipa* of South America, constitute a distinct sub-order.

Among the Freshwater Fishes are especially prominent the Cat-fishes (*Siluridæ*); the curious *Mormyridæ*, peculiar to Africa; and the Carp and Barbel family (*Cyprinidæ*); all belonging to the order Physostomi, in each of which from fifty to sixty species are known. Next in number are the *Characinidæ*, appertaining to the same order, and containing a very large proportion of peculiar forms, including the formidable species of *Hydrocyon*, whose teeth are exposed and interlocking like a crocodile's. In the order Acanthopterygii the only well-represented family is that of the *Chromides*—perch-like fishes, of which there are three peculiar Ethiopian genera; but the few *Labyrinthici* are very remarkable, being closely allied to the Indian "climbing perch," and like it possessing an accessory breathing organ enabling them to live for some time out of the water. The now almost extinct order of Ganoids, so numerous in palæozoic and mesozoic formations, has three African representatives; of which the most striking is the well-known *Protopterus*, of the sub-order *Dipnoi*, distinguished by the possession of both lung and gills.

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with all the Ethiopian species; Loew's 'Dipteren-Fauna Süd-Afrikas' (1860); Péringuey's 'Contributions to the South-African Coleopterous Fauna' (1885-92); and the writer's 'Rhopalocera Africæ Australis' (1862-65), and 'South-African Butterflies' (1887-89), the latter with the collaboration of J. H. Bowker.*

Although no separate work on the grand mammalian fauna has seen the light during the period we are now considering, the papers devoted to that class have been many, and among them some of the most interesting have been those treating of the past and present distribution of the larger species throughout South Africa. Mr. T. E. Buckley published, in 1876 and 1877, two papers on this subject, founded partly on personal observation, in the *Proceedings of the Zoological Society of London*; and Mr. F. C. Selous contributed to the same serial in 1881 two valuable articles, embodying his researches of many years in the interior. Quite recently Mr. H. A. Bryden, in 'Kloof and Karroo' (1889) gave an excellent *résumé* of this matter, treating specially of the Cape Colony, where his own experience lay.

With this too brief introduction, it may be of interest to note more systematically some of the prominent constituents of the South-African fauna, giving special attention to those forms which appear to be exclusively confined to the extra-tropical area.

MAMMALIA.

Beginning with the Mammals, we are at once struck with the scarcity of monkeys. The active and intelligent little Vervets (*Cercopithecus Lalandii* and *C. pygerythrus*, by some zoologists held as one species) inhabit only wooded tracts, chiefly on the eastern side of the country; they belong to a genus numerously represented in tropical Africa, but seem to be peculiar to the south. The only other monkey is the well-known Chacma Baboon (*Cynocephalus porcarius*), prevalent throughout rocky and mountainous tracts. Always known as a robber of gardens, this powerful species has of late acquired the pernicious habit of slaughtering suckling lambs for the sake of the milk in their stomachs, and has thus become as much the recognised foe of the Cape sheep farmer as the "Kea" ground-parrot is of the New Zealand colonist. This baboon extends far into the tropics, and in the Zambesi valley is so plentiful as to be a positive nuisance to the hunter.

* Mr. G. B. Sowerby has this year published a very useful Catalogue of the Marine Shells of South Africa, with figures of the new, and previously unfigured species.

In the singular group of Lemurs, so characteristic of Madagascar, there are two genera (*Perodicticus* and *Galago*) which are confined to continental Africa. Two species of *Galago* inhabit the south; the larger one, *G. Garnettii*, seems to be very scarce, but has been found in Natal, while the other, *G. maholi*, is well known as a native of wooded country near the upper Limpopo and to the northward. The latter is an engaging little creature, not larger than a rat, with the softest of furs, a grand bushy tail, very large dark brown eyes, and round erect ears. It is known by the names of "nagt-apie" and "bush baby," and is often kept as a pet. Quiet and sleepy during the day, this diminutive being becomes all alive after sunset, leaping and springing in all directions, and aptly clinging with its monkey-like hands and feet wherever it alights.

The Bats of South Africa, like those of many other countries, are, in consequence of their crepuscular and nocturnal habits, far more unfamiliar than the other mammals; and it is most probable that various new species await discovery. Of the twenty-two species included by Dobson in his British Museum 'Catalogue of Chiroptera,' published in 1878, five appear to be peculiar. Only three kinds of *Pteropodidæ*, or fruit-eating bats, are recorded, all the rest belonging to the insect-eating families of smaller bats, *Rhinolophidæ*, *Nycteridæ*, *Vespertilionidæ*, and *Emballonuridæ*; and it is to the two last families that the kinds believed to be endemic belong. The three fruit-bats have a wide African distribution; but while the largest, *Epomophorus Gambianus*, is confined to eastern South Africa, and apparently is not numerous there, and *Cynonycteris straminea* is recorded from Hondeklip Bay (Namaqualand) only, *C. collaris* is common throughout the country. The last-named bat, though without the "grand accommodation" afforded by the pendulous and capacious lips of *Epomophorus*, manages to dispose of an amount of fruit quite amazing, considering its small size, and is especially partial to ripe loquats. The commonest insectivorous species are the leaf-nosed *Rhinolophus Capensis*, and the little *Vesperugo minutus* and *Miniopterus Schreibersii*. A strikingly coloured bat is the rare *Nyctinomus Africanus*, from the Transvaal, whose fur is bright orange-chestnut throughout.

The Insectivora are not numerous, including only a solitary hedgehog, three shrews, four jumping shrews, and four golden moles; but there is much peculiarity among them, one of the shrews, *Myosorex varius*, constituting an endemic genus, and all the species of jumping shrews (*Macroscelides*) and golden moles (*Chrysochloris*) appearing also to be confined to South Africa. The long-snouted jumping shrews, mounted on their very long,

thin hind legs, are most comical-looking little creatures; they extend throughout Africa, but are best represented south of the Equator. The golden moles are a very distinct family, confined to the limits just mentioned, and stand almost alone among mammals in the metallic lustre of their fur. The largest species, *C. Trevelyani*, inhabits the south-east of Cape Colony, and its discovery in 1874 was due to the Kafirs near King William's Town using its skin for a tobacco-pouch.

In a country teeming with herbivorous mammals there cannot fail to be a number of Carnivora, and we find the south, no less than other parts of Africa, to be rich in predaceous species, large and small. That most beautiful of the great cats—the tiger—so dominant and widely ranging in Asia, is strangely absent from a land where its exceptional powers of destruction would have found the amplest field for exercise. This is the more striking in view of the fact that its congeners the lion, the leopard, the cheetah, and the caracal, are all common to India and Africa, and seems to indicate that the tiger is of a development more recent than the age when Southern Asia and Africa were so closely connected as to admit of the spread of animal life from one to the other.

The lion and the leopard at one time occupied the whole of South Africa; but while the latter survives in many, if not all, parts of the Cape Colony where suitable retreats are available, one must go far afield indeed to encounter the former. The cheetah, or hunting-leopard, seems never to have been so widely or generally distributed, being emphatically a denizen of the upland plains, and specially adapted for the chase of antelopes. Both the caracal ("red lynx") and the serval ("tiger-cat") are species of middle stature, and prey on small mammals and birds; and the same is the case with the ordinary wild or Kaffir cat (*Felis Caffra*), which has a very extended African range. It may here be noted that a very curious local race of the leopard, and a still more remarkable one of the cheetah, have occurred, and may perhaps still survive in South Africa. The former (of which three examples have been recorded) existed in the neighbourhood of the Koonap River, in the Fort Beaufort District of Cape Colony, and is distinguished by a multitude of very small black spots, in parts densely packed, to the exclusion of the ordinary large "rose" or ring spots, except in a few places; it looks like a variation in the direction of the well-known wholly black form which occurs not uncommonly in South India. The peculiar race of the cheetah is even more pronounced; in this case all the ordinary black spots and face stripes are replaced by dull-tawny ones, and the fur is so dense that the name of *Felis lanea*, or

woolly cheetah, has been bestowed on the variety. For many years an adult specimen, from Nel's Poort, in the Beaufort West District of Cape Colony, had been preserved in the South-African Museum, and in 1877 a living example from the same locality was obtained for the Zoological Society's Gardens in London; while since then three skins have been discovered in farm-houses in the same very limited area. In both these cases it should be observed that the variety existed, and apparently perpetuated itself, although surrounded by individuals of the normal type. It is curious that, in 1882, the skin of a pale, sandy-coloured variation of the leopard (*F. pardus*), from Matabele-land, was brought to notice by Dr. Günther, who pointed out its resemblance to the above-noted race of cheetah.

The two hyænas of the South, *H. brunnea* and *H. crocata*, formerly abounded; but since strychnine has come to the aid of fire-arms in destroying wild animals noxious to the sheep-farmer, they are both very fast disappearing from all settled districts, and the endemic brown species (which appears to have had originally a very restricted distribution in comparison with that of the spotted one) has become extremely rare. A very singular little carnivore, resembling a small striped hyæna, is the "aard-wolf" (*Proteles cristatus*), constituting not only a genus but a *family* wholly peculiar to South Africa.* This animal has the evil reputation of killing young lambs and poultry, but its dentition is so very weak and defective that this is probably a charge but little substantiated, especially as the stomachs of specimens examined have been found to contain mainly insect food. It appears, moreover, from experiments with captive individuals that the aard-wolf has no disposition to attack living vertebrate animals.

The dog family includes two notable South-African genera, *vid.*, *Lycan*, the "hunting-dog," and *Otocyon*, a relation of the fennecs or large-eared foxes. The hunting-dog is in some respects allied to the hyænas, but runs down living prey with the utmost pertinacity and ferocity—usually in packs, but also singly in the case of weak or wounded animals. Very different from *Lycan pictus* is the little *Otocyon megalotis*, which closely resembles the fennecs, but has the extraordinary number of forty-six or forty-eight teeth—four to six more than any other member of the family, the excess being in the molars, of which there are on each side in the upper jaw three or four, and in the lower jaw four. Such a liberal allowance of molars is given to no

* Since writing the above statement, I have found a record of the occurrence of *Proteles* in Angola, and even as far to the north-east as Somali-land (1891).

other living heterodont mammal; but *Otocyon* seems by no means more inclined to use its teeth on this account; specimens in captivity being specially gentle and affectionate.

The Viverrine carnivora—genets, ichneumons, &c.—are well represented, nine species being known, belonging to five different genera; of these, three genera—*Helogale*, *Cynictis*, and *Ryzæna*—and six of the species are endemic. Though small in stature these creatures, like the weasel tribe, are mostly very ferocious and bloodthirsty, and hunt down every living thing that they can master. The two black-spotted genets (*Genetta felina* and *G. tigrina*), known as “musk-cats,” and the various ichneumons of the genera *Herpestes* and *Helogale*, are all of the worst temper in captivity; but the pretty little “mier-kat” (*Ryzæna suricata*) is exceptionally good-natured and intelligent, and makes a charming pet. This small beast seems possessed by insatiable curiosity and is perpetually on the search for insect prey, using its long claws with much energy in scraping up the soil, and then sitting up erect on its haunches, and looking eagerly round in all directions. It is also blessed with the most remarkable self-composure and *sang-froid*, and it is amazing to see it coolly poke its long sensitive nose into the very face of a cat or dog ten times its size!

Two kinds of otters inhabit the country. The widely-distributed species, whose skins are so largely utilized for karosses, is the so-called nailless otter (*Lutra Capensis*), which has blunt or partly rudimentary claws; it extends to Mozambique, and perhaps also to West Africa. The second species, *L. maculicollis*, seems to be confined to Natal and the neighbouring parts. Other *Mustelidæ* are the badger-like ratel, distinguished as a plunderer of wild bees' nests; the zorilla, or African skunk, not distantly related to the pole-cats, a very handsome, but most malodorous little beast; and a very unique weasel, the *Mustela albinucha* of Gray, which in its extraordinary black-and-white livery appears to be imitative of the zorilla, and has been made by Mr. O. Thomas the type of an endemic genus, *Pecilogale*.

The only seal which can now be regarded as native to South African shores is one of the “fur-seals” or “sea-bears” (*Otariidæ*) distinguished by their small external ears, and by hind limbs sufficiently developed to admit of freer motion on land than possible to the true seals (*Phocidæ*). This species (*Otaria pusilla*) is still numerous along the coast, specimens occasionally even entering the docks in Table Bay. Robben Island and Seal Cape owe their names to this animal, whose skins and oil yield a considerable annual return among the colonial products. Of the two true antarctic seals which have been met with on the Cape coast,

one is *Ogmorhinus leptonyx*, called the "sea-leopard," with a most formidable series of acute tricuspid teeth; and the other *Macrorhinus leoninus*, the "sea-elephant," hugest of all seals, but with a dentition extraordinarily feeble.

Next to the Ungulate animals the *Rodentia* are most numerous represented among South-African mammals; thirty-two species are known, and there can be little doubt that a good many small ones remain to be discovered. The list comprises three squirrels, two dormice, seventeen mice, three mole-rats, the jumping hare, a porcupine, three true hares, and two *Octodontinæ*. Two of the squirrels belong to the curious burrowing genus, *Xerus*, which is confined to Africa, and are notable for their coarse scanty hair, bottle-brush tails, and rudimentary external ears. There are three peculiar genera among the mice—*Mystromys*, *Dasymys*, and *Dendromys*,—and one (*Petromys*) among the *Octodontinæ*. The mole-rats—*Bathyerqus maritimus* ("sand-mole") and two kinds of *Georychus* ("bles-mole")—are curious animals, with long exposed incisor teeth, powerful claws for burrowing, and exceedingly small eyes. Their fur is remarkably soft and dense, and would doubtless be valuable commercially if collected in sufficient quantity; this would be a set-off against their ravages among cultivated bulbs and tubers, and the very awkward traps for horsemen made by their deep burrows. *Bathyerqus*, by much the larger of the two forms, is confined to the Cape. The "jumping hare" (*Pedetes Caffer*) is the giant of the jerboa tribe, looking not unlike one of the small kangaroos; it has a wide range south of the equator, and its nocturnal depredations among the crops are said to be considerable. Another nightly prowler of vegetarian tastes is the porcupine, separated by Peters (as *Hystrix Africæ-australis*) from the common species of Europe and North and West Africa on account of some important differences in the formation of the skull. This animal is generally distributed in South Africa, and is found as far north as Tette and Querimba. The hares are known as the common or "vlakke" (*Lepus Capensis*), the "rock" (*L. crassicaudatus*), and the "rheebok" (*L. saxatilis*), of which the latter is much the largest and extends to the Zambesi.

It is in the great Order *Ungulata*, embracing all the ruminant and pachyderm mammals, that the African fauna is most conspicuous; and here South Africa can boast the grand array of an elephant, two kinds of rhinoceros, a hippopotamus, two remarkable forms of swine, two species of hyrax, three zebras, the giraffe, a buffalo, and no fewer than thirty-one antelopes.

The hippopotamus has long ceased to inhabit the rivers of the Cape, where it was once so abundant. A specimen in the South

African Museum was one of three that, up to the year 1856, still survived near the mouth of the Berg River, about ninety miles north of Cape Town. In September of that year this example was found dead on the river bank; he had a bullet-wound in the throat, which was apparently the cause of death, and bore many scars of recent wounds, apparently inflicted by his companions. The skin of one of his two survivors was sent to the Museum as late as 1874, but nothing has been heard as to the fate of the third and last. In the lower waters of the Orange River this animal is still to be found, as well as in the rivers on the eastern side north of Natal; and its general distribution in tropical African rivers will, now that its ivory is not as much in request by the dentist, doubtless ensure it against the extermination which threatens almost every large wild mammal in these days.

Neither of the two South-African pigs is peculiar, the commoner of them, *Potamochoerus Africanus* ("boschvaark"), being recorded from the Zambesi and Damaraland, and the wart-hog, *Phacochoerus Ethiopicus*, extending throughout tropical Africa. The latter species is remarkable for the singular lobes that project on each side of the face, and for the enormous size of its curved upper tusks. It appears to have formerly inhabited the eastern side of Cape Colony, but is now not to be met with south of Zululand.

Among the ruminants, the first place is held by the magnificent giraffe, whose many peculiarities of structure make it the representative of a distinct family, which, though now containing only a single species confined to Africa, included in pliocene times a good many huge forms, chiefly Asiatic. It is still doubtful whether this more than Saul among ruminants ever extended to the south of the Orange River, but it was unquestionably a native of the country just to the north of that stream, and still frequents Bechuanaland and the desert country westward of it.

The known antelopes of Africa now number about ninety. South Africa possesses thirty-one species, belonging to fourteen genera; and it is noteworthy that while one of these genera, *Pelea* (containing the "vaal rheebok" only), is peculiar to the country, only two Ethiopian genera—*Neotragus* and *Addax*—are without South-African representatives. Looking through the long series of these beautiful animals, no one can help being struck with admiration at their number and variety—from the massive eland, six feet at the withers, to the diminutive blue-buck, not bigger than a rabbit, there is an array of interesting forms—conspicuous among which stand out the princely koodoo,

chief of bush-bucks, and its smaller but more variegated ally the rare inyala, the grand sable and roan antelopes, the painted gemsbok, the stately water-buck, the fantastic gnooks, brown and brindled, the elegant pallah, and the quaint red hartebeest and bloom-glossed sassayby. A host of the smaller species—the pied bontebok and blesbok; the graceful springbok, sole gazelle of the South; the two reed-bucks, the bush-buck, dnyker, steenbok, grysbok, ourebi, and klipspringer, join with the rest to form an unrivalled assemblage.

Besides the vaal rheebok, mentioned above, as constituting the endemic genus *Pelea*, there are six species of antelopes which appear to be peculiar to South Africa, *vid.*: the bontebok (*Alcelaphus pygargus*), now surviving only on certain farms near Cape Agulhas; the blesbok (*A. albifrons*), very closely allied to the bontebok, but apparently always more northern in its range, and formerly in immense numbers both in the Free State and the Transvaal; the brown or white-tailed gnook (*Connochetes gnu*), with much the same distribution as the blesbok, and now become extremely rare both in the north of Cape Colony and in the Free State; the “roode rheebok” (*Cervicapra reduncus*), still reported to be not uncommon in mountainous parts of the midland and eastern districts of the Cape; and the beautiful little red-buck of Natal (*Cephalophus Natalensis*), and its dwarf congener the blue-buck (*C. pygmaeus*), both confined to wooded tracts. Until this year, that large and very handsome bush-buck the Inyala (*Tragelaphus Angasii*) was thought to be peculiar to the coast country between St. Lucia and Delagoa Bays; but Dr. Sclater has submitted to the Zoological Society a skin of it brought by Mr. A. Sharpe from near the Murchison cataracts on the Shire River, Nyassa-land. It should be noted that three of the more striking of the South-African genera—*Oreas* (the eland), *Connochetes* (the gnooks), and *Cervicapra* (the reed-bucks)—appear to be confined to Africa south of the equator; as well as four species belonging to more widely spread genera, *vid.*: the springbok (*Gazella euchores*), the steenbok (*Nanotragus tragulus*), the ourebi (*N. scoparia*), and the dnyker (*Cephalophus Grimmia*).

There is no more formidable bovine in existence than the Cape buffalo (*Bos Caffer*); though in stature and stretch of horns less than some of its Asiatic cousins, its muscular development and massive horny front, backed by a temper of sullen ferocity, render it an antagonist not to be trifled with, and hunting literature teems with the accidents and hairbreadth escapes incident on encounters with this dangerous beast. For many years the destruction of the buffalo in Cape Colony has been prohibited without express licence from the Government, and the animal

survives in some number in the forest districts of Plettenberg Bay and Fish River. An interesting point in connection with this species is that, although in Eastern Africa it appears to extend unchanged as far as the confines of Abyssinia, it is replaced in that country, as well as in parts of the centre and west of the continent, by smaller races (known as *B. æquinoctialis centralis*, and *pumilus*) with shorter and thinner horns. Smaller size in the Tropical portions of the African range of the same species, or of closely-allied representative species, would not be anticipated as probable; but the bush-buck (*Tragelaphus sylvaticus*) presents a second instance of this among mammals, and I have found as many as nine other cases noted among birds, one in amphibians, and seven in butterflies.

The equine animals include two of the most beautifully marked of all mammals, the mountain and Burchell's zebras. These two species are of wide distribution in Central and Eastern Africa, but, while it does not appear that *Equus Burchellii* ever extended south of the Orange River, *E. zebra*, on the contrary, was prevalent throughout the mountainous tracts of the Cape Colony and thanks to its attachment to elevated places, it still survives in many different quarters. Quite recently (in July, 1892), Mr. S. D. Bairstow saw a herd of about twenty within a few miles of the town of Cradock in the north-east of the Colony. The third species, *E. quagga*—formerly so numerous on the karroo plains—has unhappily become extinct. Without the elaborate ornamentation of its allies, it was of high interest, both as a link between them and the wild asses of North-East Africa, and as an endemic species of South Africa proper, not ranging beyond the Vaal River. Moreover, it was a fine strong animal, more horse-like than its striped congeners, and, from the little evidence obtainable more amenable to domestication. Mr. H. A. Bryden ('Kloof and Karroo,' p. 393) is disposed to date the quagga's extinction in Cape Colony as between 1860 and 1865, but notes that it survived in the Orange Free State until more recent years.

The two African rhinoceroses are characterized by the absence of canine and incisor teeth, and the want of those strong folds in the skin which are conspicuous in the Asiatic species. *R. bicornis* the common or "black" two-horned kind, with a prehensile upper lip, is prevalent all through the continent, and formerly extended to the extreme south. It occasionally possesses a small third horn. Gordon Cumming mentions having shot one with this additional horn, and I recently saw a specimen exhibiting this variation in the British Museum. The so-called "white" or square-nosed rhinoceros (*R. simus*) is of more interest, and call for a few remarks. In the first place, it may almost be regarded

as specially South-African, as it was discovered by Burchell (in the year 1812) about Latakoo, and is unknown north of the Zambesi; and secondly, it is the largest of all existing land mammals, except the elephant, and is now on the verge of extinction, if not already a creature of the past. Less than sixty years ago it must have been still very numerous in the southern part of its limited range, for Harris, writing of the "hosts" of rhinoceroses seen by him near the Limpopo in 1837, observes:—"On our way from the waggons to a hill not half a mile distant we counted no less than twenty-two of the white species of rhinoceros, and were compelled in self-defence to slaughter four."* Even twenty years ago, Selous tells us, the animal was fairly plentiful in the western half of tropical South Africa, and up to 1874 he found them so on the River Chobe; but in 1877 he saw the spoor of two only in the same district, and in 1879 no spoor at all. More to the eastward, however, he found a good many, as late as 1880, in northern Mashonaland and near the Sabi River, and in 1883 he shot a pair in southern Mashonaland, and preserved the skull and skin of the head of the male for the South-African Museum. As this excellent authority is most decidedly of opinion that *R. simus*, if not absolutely extinct, survives in a very few individuals only, we may be thankful that a mounted specimen of the adult exists in the Leyden Museum. A very characteristic feature of this huge rhinoceros is the length of the front horn, the female having a thinner but longer horn than the male. This superior length in the female may be associated with the fact—first recorded by Gordon Cumming, and since confirmed by Selous and other hunters—that when a young calf accompanies its mother, whether in walking, trotting, or galloping, it keeps always close in front of her, and is guided exactly by the mother holding the point of her horn upon its back. A good illustration of this maternal directing care is given in vol. ii. of Cumming's 'Five Years of a Hunter's Life in South Africa' (1850). The longest horn seen by Selous measured

* Harris writes not only graphically, but in the main accurately, of the animals he met with, and thus it is the more astounding to find the following extraordinary statement on the same page (183) of his 'Wild Sports of Southern Africa' (5th edition, 1852), from which I have quoted the above:—"In removing the horn" [of a rhinoceros, but of which species is not noted] "with an axe, the brain was discovered, seated in a cavity below it, at the very extremity of the snout" [!]"—"a phenomenon which may in some measure account for its want of intelligence and piggish obstinacy, as well as for the extraordinary acuteness of smell with which it is endowed." As the deliberate statement of a hunter-naturalist of great experience, this amazing blunder is probably unequalled in the entire range of zoological literature, and one can only marvel what it could have been in poor rhino's nose that was so libellously declared to be his brain!

4½ feet, but one preserved in the British Museum is recorded as three inches longer, "very slender and nearly straight." In the South-African Museum there are two knobbed sticks made from horns of this species, one of 4 feet 4 inches and the other of 3 feet 10 inches.

Few animals are more familiar to the Cape colonist than the curious little "dassie," or rock-rabbit (*Hyrax Capensis*), which is so numerous and widely-spread a denizen of elevated rocky situations from Table Mountain to Natal. So anomalous in structure are this animal and its congeners (all continental-African, except the Arabian and Syrian *H. Syriaca*), that it has been one of the greatest of zoological problems to make out their true affinities and position among mammals. The general vague resemblance to a rabbit is due merely to size and colouring, and to the prominence of the incisor teeth; for the dentition and the formation of the hind feet are actually very close to those of the rhinoceros, and the brain is also of an Ungulate type, while other portions of the internal anatomy are altogether peculiar. Accordingly the genus has been advanced by modern naturalists to the rank of a sub-order, or even order, *Hyracoidea*. One of the most singular modifications in the dassies is that of the padded and deeply-cleft soles of the feet, enabling the animal not only to ascend almost perpendicular rocks, but also to adhere with much tenacity to such surfaces. This peculiar structure is more developed in those species of *Hyrax* that frequent trees, such as *H. arboreus*, a species found from the eastern part of Cape Colony as far north as Mombasa. *H. Capensis*, which was the first species scientifically described, is peculiar to South Africa, unless *H. Scioanus* of South Abyssinia is identical with it.

The African and Indian elephants are the sole living representatives of the once numerous tribe of Proboscidea occupying both the Old and New Worlds, and the African one has by some authors, on account of various marked differences, been separated generically as *Loxodon Africanus*. South of the Sahara there seems to have been no limit to the range of this giant beast, except the sea-coast itself. The early settlers, as above mentioned, met with troops of elephants in the south-west extremity of the Cape Colony, and teeth of the animal are often exhumed from superficial deposits in that quarter. The latest of these, a small molar, was found the other day (July, 1892) quite close to Cape Town, under an accumulation of blown sand on the flats. Elephants, under protection by the Government, still survive in the wild state in the Cape Colony, but only in the coast-line forests of Knysna and Plettenburg Bay, and in the Addo Bush, not far from Port Elizabeth. The incessant

massacre of an animal that breeds so slowly could not go on as it has done for the last hundred years without the inevitable result of extermination; and indeed, apart from the preserved herds just mentioned, it is only in some very out-of-the-way tracts that wild elephants in any number can be met with south of the Zambesi.

The last of the South-African mammals to be noted are those singular Edentata the "aardvaark" (*Orycteropus Capensis*) and the scaly ant-eater (*Manis Temminckii*). These widely-different animals are alike in being specially modified for feeding on the termites or white ants, and for breaking open the hard nests of those insects. The long snout and ears, heavy slightly bristly body, and strong hoof-like nails of *Orycteropus* fully account for its local name. It sleeps by day in the burrows which it excavates, and so is rarely seen; but there can be no doubt that, notwithstanding a good deal of persecution for the sake of its flesh and skin, this bulky and muscular beast is still fairly numerous, and likely to remain so in most parts of the Colony. Unlike the manis, the aardvaark possess a few small teeth at the back, and Mr. O. Thomas has lately discovered that some of these teeth are preceded by a milk-dentition,—a character distinguishing the animal from all other edentates except a genus of armadillos (*Tatusia*). The northward limit of *O. Capensis* is not clearly ascertained, but it is reputed to be found both in Angola and Mozambique. The only other species, *O. aethiopicus*—which is a very close ally—inhabits N.E. Africa (Kordofan and Upper Nubia), and also, it would appear, Senegal in the north-west; but where one form first replaces the other has not yet been made out.

The scaly ant-eaters, also known as pangolins, are confined to Africa and Southern Asia: and of the five African species only one, *M. Temminckii*, extends to the south. All these animals look more like reptiles than mammals, with their long bodies and tails, short legs, narrow heads, and extraordinary armour of large overlapping scales; some are arboreal, climbing readily with the aid of their strong claws, long tails, and the projecting points of the scales. When rolled into a ball, with the scales thrown into a half-erect position, one of these animals is safer than a hedgehog from ordinary assailants; but the South-African species appears to have been much reduced in numbers by a superstitious native custom of burning it in the kraals to bring fecundity to cattle. The few specimens which have been acquired by the Museum have mostly come from the north-east of the Cape Colony and the Orange Free State, but the species is known to occur throughout East Africa as far north as Kordofan.

BIRDS.

Birds are beings of such bright animation, grace of movement, and wealth of colouring—many of them exhibit such winning intelligence, such melodious song, and such wonderful skill in nest-building, that they are certainly the most attractive of vertebrate animals. It is thus no wonder that they have everywhere received the special attention of field observers and of zoologists, and are, as a class, probably more completely known than any other, notwithstanding that the difficulties of their classification remain exceptionally great, and are far from a satisfactory solution. In South Africa the bird-fauna has been assiduously collected and recorded, and we possess a very fair knowledge of its extent, character, and distribution over the country. The occurrence of close upon seven hundred species has been observed in this extra-tropical tract, but from this number should properly be excluded some twenty kinds of albatrosses, petrels, and allied birds, which are strictly oceanic denizens of a more southern belt, only approaching or at seasons frequenting the coast, without ever nesting on any part of it.

The Passerine birds are everywhere far in excess of any other order, and their ranks in South Africa fall short only by about sixty species from equalling all the other orders of native birds combined. It is in this very numerous and most highly organised order that eight of the nine genera and one hundred of the one hundred and forty-three species peculiar to South Africa are included, and the eleven other genera represented in South Africa that are not known to occur north of the equator are also all passerine. The most prevalent families are those of the thrushes, warblers, and chats (49 species), weavers (46), babblers (37), fly-catchers and larks (22 each), pipits and wagtails (19), shrikes (18), and swallows and sun-birds (16 each); while the least numerous are the crows and caterpillar-catchers (3 each), and the orioles and drongo-shrikes (2 each).

Sustained melodious song, the crown of the higher bird life, does not attain to its highest development among the South-African Passeres, but the "wood-notes wild" of many of them are yet of exquisite freshness and sweetness, as any one will testify who has heard the Cape canaries, yellow bullfinches, ferruginous lark, short-tailed pipit, and chat-thrush or robin. The hooded chat, or "schaap-wachter," has quite a repertory of songs and recitations, which he "adapts" from other birds', and even from mammals' utterances; and in this habit he is to some extent followed by the handsome "bakbakiri" wood-shrike,

whose loud clear voice is ever cheerful and inspiring, his challenge generally evoking varied response from his fellows.

The male sun-birds (*Nectariniidæ*), commonly known to the Colonists as "sugar-birds," certainly excel in point of beauty, their slender forms being set off by metallic colouring almost rivalling that of humming-birds, and according well with the rich hues of the flowers, from which they obtain their chief supply of insect food. Several of them have a very sweet, short song. The peculiar South-African genera and species are the lovely orange-breast (*Anthobaphes violacea*), common in rocky localities, and the two kinds of *Promerops*, which are of unusually plain tints in both sexes, but conspicuous by their larger size and extremely long tail feathers.

The native fly-catchers (*Muscicapidæ*) exhibit the greatest speciality, there being three endemic genera—*Pogonocichla*, *Lioptilus*, and *Stenostira*—each represented by a single species only. All three are small birds of retiring habits, but *Stenostira scita* is a tiny creature only $4\frac{1}{2}$ inches long, numerous among the river-bed "mimosas" (*Acacia horrida*) in the karroo districts of the Cape, with a delicate plumage of black, gray, and rosy-white. The seven other endemic species belong to the genera *Chloropeta*, *Alseonax*, *Smithornis*, *Batis*, and *Trochocercus*.

The shrikes (*Laniidæ*) are mostly pugnacious and self-asserting birds, and one of their most prominent representatives is the "fiskal" (*Lanius collaris*), well known to all colonists as the audacious and persistent assailant of caged birds. The "larders" of this fierce little hunter often include quite a varied zoological collection of impaled victims. I have noticed in them young birds, small snakes, lizards, frogs, locusts, carpenter-bees, and caterpillars. The "bakbakiri" bush-shrike (*Laniarius gutturalis*) is much hustled and chased by the fiskal, although too strong to be murdered by him. A still handsomer bush-shrike is *L. quadricolor*, peculiar to Natal, whose green, yellow, and black plumage is set off by a rich red gorget.

Among the *Sturnidæ*, the glossy starlings, locally called "spreeuws," are conspicuous, with their plumage shot with fine metallic tints of bluish-purple, dark green and coppery. Most beautiful of the family is the male of the small *Pholidauges Verreauxii*, a south-tropical species, which migrates as far as Natal, whose changeable purple and lake upper plumage is contrasted with the purest white on the under parts.

Africa is the metropolis of the *Ploceidæ*, a family including the weavers, widow-birds, waxbill-finches, etc., notable for their admirably-woven and singularly-shaped (often pendulous) nests, and for the brilliant colours or vastly developed tail feathers

assumed by the males in the courting season. The nesting places of such active and gregarious species as the yellow weaver (*Hyphantornis Capensis*), the yellow reed-finch (*Pyromelana Capensis*), or the latter's splendid congener the scarlet reed-finch (*P. oryx*), are scenes of the utmost animation. The sociable weaver (*Philetærus socius*), inhabiting the country north of the diamond fields, though very plainly coloured in both sexes, is celebrated for the huge nest it builds in the "kameel-doorn" acacias, an abode accommodating thirty or forty pairs, and described as consisting of a cartload, or several cartloads, of grass and sticks. The Kafir-finch (*Chera progne*) is a marvellous sight when in courting attire. Such are the weight and dimensions of his glossy black tail-plumes, that he is incapable of flight in a strong breeze.

The Lark family (*Alaudidæ*) is well represented, twenty-two species occurring. Four belong to two peculiar genera (*Certhilanda* and *Heterocorys*); while three other genera are not known north of the equator. *Heterocorys* includes only one short-billed species, which is very rare; but *Certhilanda* contains three long-billed species which are all widely distributed, *C. garrula* usually keeping in small flocks. The common *Mirafrapiata* is quite unique in the exquisite tinting and elaborate marking of its plumage, making it look like a miniature game-bird.

The order *Picariæ* comprises a number of not very closely related families of birds, for the most part less familiar to non-naturalists than the *Passeres*. In South Africa they are very far from approaching the latter in number, eighty-five species only being recorded; but most of them are distinguished by considerable size, bright colouring, or singularity of form. The swifts and goatsuckers, the kingfishers, bee-eaters, rollers, hornbills, hoopoes, and colies; the honey-guides and barbets; a trogon; the plantain-eaters and cuckoos; the woodpeckers and a wryneck, compose this varied assemblage. The cuckoos head the list with fifteen species; then follow the kingfishers with ten, and the woodpeckers and barbets with nine each. It is the woodpeckers (*Picidæ*) alone which exhibit any generic form specially characteristic of South Africa, *Geocolaptes*—containing a single species, *G. olivaceus*—being peculiar. The bird in question is an instance of special modification; wherever found, in the Cape and Natal, it excavates not tree trunks but the soil, preferring river-banks or hill-sides, and seems to flourish throughout its range. In this ground-pecking habit it is nearer to the American genus *Colaptes* than to its African relations. Of the other *Picidæ* only one kind, *Campethera notata*, is peculiar; it inhabits the wooded districts of the south-east of Cape Colony.

The kingfishers (*Alcedinidæ*) include one of the largest (*Ceryle maxima*, fourteen to sixteen inches in length), and one of the smallest (*Ispidina Natalensis*, only four inches) species known. The former is a bold fisher, securing fishes, frogs, and crabs with its immensely powerful bill; but the tiny blue and orange *Ispidina* is stated to pursue only butterflies and other insects. The abundant *Corythornis cyanostigma*, not very much bigger than the last-named and even more beautiful with its great greenish-blue and black crest, is, however, a true fish-eater, and like the English species lines its nest with the rejected bones. Two species apparently peculiar to South Africa are *Halcyon albiventris* and *H. Senegaloides*; the former a rather dull-coloured bird which feeds on insects and worms, and is widely distributed, the latter with much more blue about it, and confined to mangrove swamps on the Natal coast, where it lives chiefly on crabs.

Very grotesque-looking are most of the hornbills (*Bucerotidæ*), which rival the South-American toucans in the extraordinary bulk and shape of their beaks. The males have a most surprising custom of building in the females during incubation, only leaving a small hole for supplying them with food. The most imposing of the six South African species is the huge black ground hornbill, *Bucorax cafer*, called "bromvogel" from its peculiar deep droning cry. This bird is almost as large as a turkey, and usually goes about in small companies of six to ten individuals. The primary feathers of the wings are white, and have a startling effect when one surprises a group of "bromvogels" into their laboured flight.

The colies (*Coliudæ*) are curious in many ways, one of their structural features being that all four toes are directed forward. The few species known are confined to Africa, and of the three found in the south, one, *Colius striatus*, is peculiar. They are known to the colonist as "mouse-birds," and are pleasant, sociable little creatures, although undoubted depredators in the fruit-garden. Their flight is very short, and they not only keep together in little companies of about eight or ten, but have a friendly habit of roosting for the night packed close together with their head downward, so that in the dusk the cluster looks like a nest.

Few birds have awakened more interest than the honey-guides (*Indicatoridæ*), owing to their celebrated faculty of leading the way to wild bees' nests. They are a very limited group of about eleven species (if we include the two kinds of *Prodotiscus*, one of which, *P. regulus*, is peculiar to Natal), and mostly natives of Africa, only two belonging to the Oriental region. Four of the genus *Indicator* are found in the South, and three of these are known as guiding to bees' nests. The object of the birds is not

the honey but the grubs, which they devour with much eagerness when the combs are exposed. The guiding habit would appear to be one of comparatively recent acquisition—that is to say during the human period; but very possibly its practice is in reality much more ancient, and has simply been extended to man from the ratel and other comb-robbing mammals found serviceable to the bird. The honey-guides appear to have the same parasitic habits as the cuckoos, some of them being known to lay their eggs in the nests of barbets and woodpeckers.

It is curious that two of the chiefly South-American, but partly Oriental family *Trogonidæ*, should inhabit Africa, and still more remarkable that these two should, in their green and crimson colouring and serrated bill, be nearer to several American than to any Indian species of the group. *Hapaloderma Narina* inhabits the East and South, and is called “bush-loorie” by the Cape colonists; it is one of the shyest of forest birds, and sits sluggish and apparently half-asleep on a branch, until some passing insect rouses it into active pursuit. The late Jules Verreaux was responsible for the discovery that the rich crimson on the underparts of *T. Narina* is completely washed out during heavy rain storms, and is revived in its full intensity only after an interval of some days. That the red colouring-matter of the body-plumage of this bird, as well as that of the wing-feathers of some plant-eaters, is readily extracted in alkali is well known; but it would be an extraordinary thing if the statement should be confirmed that the colour is so little “fast” as to be washed out of the living bird by mere rain, and its restoration would seem equally inexplicable.

The touracos or plantain-eaters (*Musophagidæ*) belong to Africa only; they are nearly confined to the tropics, not more than three of the twenty-five known species being natives of South Africa. Two of these three belong to the genus *Turacus*; but they are singularly handsome, having green for the foundation tint to their plumage and bright crimson wing primaries, but *T. albocristatus*—the “loorie” of the colonists—has a prominent, erect white-tipped crest, and *T. porphyreolopha*, all the upper parts shot with metallic purple and blue. The former is much the commoner species, and is abundant in the Knysna forests; it appears to be endemic, while the other species extends southwards from the Zambesi. The third kind, *Schizorhis concolor*, is almost wholly of a plain ashy grey; it occupies a wide belt of Southern Tropical Africa, but does not extend extra-tropically further than about 25° 24', where it was originally discovered by Andrew Smith.

Of the fifteen cuckoos (*Cuculidæ*) known in South Africa,

appear to be summer immigrants only, except three species of "lark-heel" (*Centropus*) and the "coucal" (*Ceuthmochares australis*). Most beautiful are the "emerald" (*Cuculus smaragdineus*) and "golden" cuckoos (*C. Klaasi* and *C. cupreus*), especially the former, which displays an intense metallic green upper surface in contrast with under parts of canary-yellow.

The order of parrots (*Psittaci*) does not appear to flourish in any part of Africa; Salvadori's just published British Museum catalogue gives for the whole continent only twenty-five species belonging to four genera. Temperate South Africa has but three kinds, but four others are found south of the equator. The largest of the three, *Paeocephalus robustus*, comes much further south than the others, being not uncommon in woods on the eastern border of Cape Colony; while *P. Meyeri* does not occur south of Bechuanaland and Transvaal, and the little love-bird, *Agapornis roseicollis*, scarcely comes across the Orange River. Both the latter take very kindly to captivity, and are familiar pets in many households.

The pigeon order (*Columbæ*) also musters but feebly; there are eleven native species, of which three appear to be endemic. Some noticeable species are the green tree-pigeon (*Treron Delalandi*), the long-tailed ground-dove (*Ena Capensis*), and three kinds of turtle-doves (*Turtur*). The peculiar pigeons are the berry-loving "olive dove" (*Palumbus arquatrix*), a large and handsome bird with bright yellow bill and legs, which chiefly haunts the coast districts; the rare *Turturæna Delegorguei*, found only in Natal; and the "cinnamon," or "lemon," dove (*Haplopelia larvata*), which is widely spread in wooded parts.

In every way curiously intermediate between the pigeons and the gallinaceous birds come the remarkable sand-grouse (*Pteroclidæ*), which many ornithologists rank as a distinct order. They are known in South Africa as "Namaqua partridges;" and, in illustration of the debateable position they occupy, it may be noted that a very warm dispute not long since took place at the diamond fields as to their right to protection as "game" birds. The game law vaguely mentions "grouse;" and as no true grouse inhabits South Africa, it seemed pretty obvious that sand-grouse must have been intended by the framers of the Act; but many sportsmen, insisting on their indisputable affinity to pigeons alike in structure and in flight, stoutly refused to make game of the *Pteroclidæ*, notwithstanding that they lay their eggs in the ground and that the young are covered with down when hatched. Four species are found in the country, but they mostly inhabit the interior, *P. Namaqua* being the only one that habitually extends its range through the Cape Colony. They are birds of very great

powers of flight, and seem to be constantly migrating from one tract to another. Though keeping in pairs, or in small family groups, while feeding, the sand-grouse assemble in immense flocks in their morning and evening visits to the pools or "pans" where they drink.

Three families of the order *Gallinæ* find a place in our fauna, but those of the pheasants (*Phasianidæ*) and reed-quails (*Turnicidæ*) have each but two representatives, the remaining thirteen species all belonging to the partridges (*Perdicipidæ*). Two guinea-fowls alone represent the pheasant tribe, but one of these, *Numida Verreauxi*, appears to be strictly confined to the coast of Natal and Zululand. Ten francolin partridges are native—all very handsome birds; and three of them, the so-called "pheasant" (*Francolinus clamator*), and the "grey-wing" and "red-wing" partridges (*F. afer* and *F. Levaillantii*), are peculiar. There are three true quails (*Coturnix*); but except the common quail (*C. communis*), which though a regular migrant leaves stragglers who stay in South Africa all the year, no member of the genus is numerous.

In the *Accipitres*, or birds of prey *par excellence*, South Africa is rich, nearly all the families and sub-families being represented. The list includes seventy species, *vid.*: six vultures, the secretary, ten sparrow-hawks and goshawks, six harriers, three buzzards, thirteen eagles, three kites, the honey-buzzard, thirteen falcons and kestrels, the osprey, and thirteen owls. Out of this long series one-tenth appear to be endemic, *vid.*: six diurnal species and one owl. Looking through a collection of these voracious birds, from the tiny falconet, *Poliohierax semitorquatus*, to the huge lammergeier, *Gypaëtus ossifragus*, one marvels how so many species ever manage to find a living in the apparently poorly-stocked wastes of South Africa. There can, indeed, be no doubt that the competition for the available prey must be intensely keen amongst them, and that their wonderful powers of sense and of muscle must be perpetually in the fullest exercise.

Notable among the diurnal raptorial birds is the secretary (*Serpentarius secretarius*), whose reputation as a snake-eater has stood it in good stead among the colonists. Its length of limb undoubtedly gives it an advantage in dealing with a venomous snake, but in all probability the bird avoids such formidable prey as long as other food can be found. Like most of the larger predaceous birds, it cannot afford to be particular, and devours any kind of animal it can master, not disdaining insects on occasion. The secretary is widely dispersed over the African continent, but seems to be commoner in the South. The proper position of this stately creature in its class has been much debated some points in its anatomy distinguishing it from the *Accipitres*

ally, and indicating alliance to both the cranes and the *Æ*; but on the whole ornithologists now seem to be agreed regarding it as coming within accipitrine limits.

3 huge vultures, *Gyps Kolbii* and *Otogyps auricularis*, do not to advantage on the ground, and are objectionable alike to and nose after a gorge of carrion, but on the wing they are ery perfection of ease and grace, floating in wide circles for together, with every great wing-feather sharply outlined st the sky, and often ascending to altitudes where they are o our sight. In Natal, I once came upon a nesting-place of *Kolbii* in a precipitous ravine. The old birds were all t when I arrived, but not long after began to return to their among the crags; and it was a magnificent sight to watch fifty or more of them sweeping past, mostly on a level with sition, but some both above and below it. Such was the us with which the great birds passed, that I felt as if the of air from the nearest of them would make me lose my g.

ong the many fine eagles are conspicuous the tawny *r rapax*, a near relative of the European golden eagle; the and white *A. Verreauxii*, known as the "dassie-fanger" and -haan," and formerly often seen about Table Mountain; he rare martial eagle (*Spizaëtus bellicosus*), a most powerful s with talons of unusual size and strength. The only eagle ar to South Africa is *Circaëtus fasciolatus*, confined to Natal. f the two endemic harriers is *Circus maurus*, a handsome and white species restricted to the Cape Colony. The ing : goshawk, *Melierax canorus*, is also endemic; it is oner in the karroo districts than elsewhere, and really a ble singer for a bird of prey. The very large buzzard, *jakal*, is also peculiar to the South; it has been known to e with success even so active and pugnacious a venomous as the "ringhals" (*Sepedon hæmachates*).

e South-African owls exhibit a striking variety in stature, the eagle owl (*Bubo lacteus*), which attacks even domestic ry, to the little *Carine perlata*, more formidable to insects to vertebrates. It is to the typical genus *Strix* that the endemic species (*S. Capensis*) belongs; this bird being quished at once from the universal barn owl by its much er dorsal plumage and facial disk, and being very much than its familiar congener.

re rails, sun-grebes, cranes, and bustards, are associated in Order *Geranomorphæ*. Among the sixteen South-African es of rails (*Rallidæ*), no fewer than seven are European including such well-known birds as the water-rail, corncrake,

crested coot, and water-hen. Three of those recorded appear to be peculiar, *vid.*, the pretty little *Corethrura pulchra*, and *C. ruficollis*, both pretty widely but sparsely distributed, and the very rare *Coturnicops Ayresii* from Transvaal. The three cranes are the "wattled" (*Grus carunculata*), the "Stanley" (*Anthropoides paradisica*), and the "crowned" or "mahem" (*Balearica chrysolophus pelargus*), of which the last is most remarkable. As many as ten bustards (*Otididae*) adorn South Africa, where the larger species are known as "paauws," and the smaller as "knor-haans." The grandest is the "gom paauw" (*Otis Kori*), the male of which attains a weight of thirty pounds and a height of four feet; its expanded wings measuring eight feet across; this species is known to occur as far north as Mashonaland and the Cune River. The two other "paauws" (*O. Caffra* and *O. Ludwig*) are considerably smaller but of fair stature, and much in request for the table. The three endemic bustards are among the smallest kinds or "knor-haans," *vid.*: the "common" (*O. Afra*), the "vaal" (*O. scolopacea*), and the "blaauw" (*O. caerulea*); the plumage is of singular beauty, and is set off in *O. scolopacea* by rich pink gloss, while *O. caerulea* has nearly all the body and neck of a soft blue.

The mass of the Order *Limicolæ* consists of the *Charadriidae*, family comprising the plovers, sandpipers, snipes, curlews, and other groups. There is little characteristically African among these birds, except the coursers (*Cursorius*), which are mainly desert forms; and, in fact, over half (twenty-two out of forty-three) the species recorded as South-African are—like so many of the swallows, warblers, and swifts—merely summer visitors from the far North. This group is apparently the most migratory in existence, and many species that visit us between September and March spend the northern summer in their nesting haunts on the near the Arctic circle ten thousand miles away! South Africa seems to have but one endemic species, Burchell's coursing (*Cursorius rufus*), which frequents the karroos of Cape Colony and elevated tracts in the north of Natal and in the Transvaal; and, like all its congeners, is amazingly fleet of foot. Near allied to the coursers are the singularly modified pratincocks (*Glareola*), which, both in form and flight, are much like swallows among which Linnæus originally placed the South-European species *G. pratensis*. This species, on its southern migration only occasionally reaches South Africa; but Nordmann's pratincocks (*G. melanoptera*) is a regular summer visitor, being indeed the "small locust-bird" of the colonists, and as the untiring destroyer of the migratory locusts regarded with no ordinary interest and favour. It is an interesting sight to watch a flock of the

wonderfully active little birds pursuing their winged prey high in air; their beaks are so constructed that they easily snap off the locusts' wings, and these rejected members fall in showers to the earth, while the bodies are promptly devoured without alighting.

Heron, storks, spoonbills, ibises, and flamingoes constitute the Order *Herodiones*, wading birds, for the most part, of large size and wide distribution. Of the herons, as many as seventeen are known in South Africa, nine of them being also inhabitants of Europe. The largest species, *Ardea Goliath*, is mainly a south-tropical bird, but extends through the Transvaal to Natal, and is occasionally seen in the north of Cape Colony. The tufted umbre, or "hammer-kop" (*Scopus umbretta*), is one of the most remarkable allies of the heron family, its hook-tipped bill relating it to the extraordinary *Balaeniceps rex* of Central Africa. It is very generally distributed from the Zambesi to the Cape of Good Hope, haunting pools and streams at dusk, and feeding on frogs and fish. There is nothing remarkable in the appearance of this moderate-sized plain brown bird except its long, business-like bill and large occipital crest; but its immense nest of sticks, placed in a tree or on a rocky ledge, is a curious affair, measuring five or six feet across, but having quite a small entrance. The possible object of so huge a structure is to puzzle any inquisitive enemy as to the actual position in the mass of the eggs or young—on the principle of the acknowledged difficulty of finding a needle in a haystack.

Three ibises are South-African, including the well-known sacred ibis (*I. aethiopica*), which is met with in many parts, but appears to be an irregular migrant. Of the other two, the bald ibis (*Geronticus calvus*) is peculiar; it is locally known as "wilde kalkoen," or "wild turkey," in allusion to its glossy metallic plumage and bare head and neck.

In the Order *Anseres* three species of geese and thirteen of ducks are South-African, but only one, a spiny-tailed duck (*Erimatura maccoa*), is endemic. This is a handsome bird, distinguished by its chestnut and brown plumage, black head and pale-blue bill, as well as by the rigid tail-feathers. The tiny goose (*Nettapus auritus*) is of great beauty, shining-green and black above, and pale-rufous beneath; it is well worthy of domestication among the ornamental water-birds.

The pelicans and gannets, the cormorants, and the darter or "make-bird," represent three families of the Order *Steganopodes*. On the South-African coast the gannet (*Sula Capensis*) and the smaller cormorant or "duyker" (*Phalacrocorax Capensis*) are extremely abundant, and of importance as the chief yielders of

the local supply of guano. On this account they (with the penguin) have recently been placed by the Cape Government under protection, notwithstanding that their abundance is to some extent prejudicial to the fishing industry.

Among existing birds few are stranger than the penguins which constitute the Order *Impennes*, and are characteristic of antarctic seas. The only species that can be held as a South African native is *Spheniscus demersus*, stragglers only of the "macaroni" penguin (*Eudyptes chrysocoma*) having reached Cape shores. The Cape penguin is very numerous and breeds on the various islands close to the coast. Anderson notes that in the breeding-places frequented by these birds they always occupy the highest ground, the gannets coming next, and nearest to these the cormorants.

The ostrich is the sole African representative of the sub-class *Ratitæ*, but the largest of that now very limited group, and indeed of all existing birds. It has an extremely wide distribution throughout the continent, extending also to Arabia and Syria. There can be little doubt that in South Africa the demand for its feathers would long ere this have occasioned its extinction, but for the fortunate discovery that it could readily be domesticated. Several ornithologists have advocated the separation of the Southern from the Northern bird, under the name *Struthio australis*, on the very slight grounds that it is larger, that the black plumage of the male is darker, that the skin of the bare parts is bluish instead of flesh-coloured, that the top of the head has some hair-like feathers instead of being bare, and that the eggs are more deeply pitted. With regard to this difference last mentioned, it is curious that Sclater ('Trans. Zool. Soc.,' iv., p. 354) states that the egg attributed to the Southern bird is smaller and less deeply pitted,—just the opposite to Tristram's observation ('Ibis,' 1860, p. 74); but as a matter of fact there is very great diversity in these respects among the eggs of the Cape Ostrich, as every local breeder can testify.

REPTILES.

In comparison with their distinguished and now rather distant relations the birds, reptiles have but few admirers and scarce any friends. Owing to the fatal venom of many snakes, it may emphatically be said of reptiles generally that to most people "the trail of the serpent is over them all." Only the tortoise appear to have escaped the popular ban, and to be regarded without dread or disgust; indeed, despite their decided want of animation, they are not seldom treated as pets.

The *Chelonia* of South Africa are not by any means numerous, nor is there among them any peculiar genus; but, on the other hand, there is rather a marked development of the strictly terrestrial tortoises in comparison with other parts of the continent. The eleven recorded African species of *Testudo* are all found in the South, and no fewer than eight of them are peculiar, and of the four species of *Homopus* three endemic species are South-African. *T. geometrica* and its allies form the bulk of these peculiar forms; they are handsomely marked small tortoises, with more or less hooked noses, *T. tentoria* being distinguished by the projection into humps of the dorsal shields or scutes. The largest species is the well-known *T. pardalis*, which attains a length of two feet, and is common in many parts of the country; by the side of its small compatriots it looks very large, but is, like all existing continental land tortoises, a mere dwarf in comparison with its huge insular congeners in Aldabra and (until recently) the Galapagos archipelago. Both *T. pardalis* and the next largest South-African species, *T. calcarata*, are found in tropical East Africa, the latter as far north as Abyssinia. *Homopus* is a genus of small tortoises highly characteristic of the South, the only tropical species being one found in Senegal. *Cinixys*, on the contrary, belongs to the tropical parts, but *C. Belliana* is mentioned by Sir A. Smith as "inhabiting the country to the north and east of Port Natal;" the species of this genus are remarkable for having the front of the carapace hinged and moveable.

Only two water-tortoises inhabit South-African streams and pools—*Sternotherus sinuatus* and *Pelomedusa galeata*—neither of which attain any great size. The former is well distinguished by having the front part of the plastron or under-shell moveable, so as to enclose the head and front limbs when drawn in.

The Ethiopian region possesses four crocodiles (including one peculiar to Madagascar), but two of them appear to be limited to the west tropical rivers, and the only species extending to South Africa is the crocodile (*Crocodilus vulgaris*), which prevails throughout the continent, except in those arid tracts where water is merely temporary. The south and west of South Africa seem never to have been tenanted by this formidable reptile, but to the north and east of Cape Colony it was formerly numerous, and is said to be still found in the coast rivers of Natal. The size of this animal is commonly much overstated, "fully twenty feet" being often given as its length; but the finest specimen in the British Museum series, brought together from all parts of Africa, measures under fifteen feet.

The great Order of Lizards (*Sauria*) does not seem to be very

extensively developed in South Africa; but it is not improbable that a good many forms still await discovery in the less-known districts. There are ten families and thirty-one genera represented, the number of species regarded as valid by Boulanger being eighty-seven. It is interesting to note a considerable amount of peculiarity in this limited number, seven genera and fifty-nine species being South-African only, while two families (*Zonuridæ* and *Gerrhosauridæ*) are almost confined to the country, possessing beyond it only a very few representatives in the south-tropical area and in Madagascar. The family richest in genera is the Geckos, with 7, and then follow the Skinks with 6, and the *Lacertidæ* with 5. The *Scincidæ* have 18 native species, the *Lacertidæ* 15, the Geckos 14, the *Zonuridæ* 11, the *Gerrhosauridæ* 8, and the Chameleons 7. The genera richest in endemic species are in the Geckos, *Pachydactylus* (6); in the *Zonuridæ*, *Zonurus* (4); in the *Lacertidæ*, *Eremias* (6); in the *Scincidæ*, *Scelotes* (7); and in the *Chamæleontidæ*, *Chamæleon* (6).

The Geckos are mainly nocturnal, as might be at once inferred from their large eyes with vertical pupil; they usually have their toes dilated into adhesive disks. Some of the smaller Cape species of the genus *Pachydactylus* are much dreaded for their imaginary venomous character, and scant mercy is extended to the harmless "gaetje," without regard to its services as a destroyer of nocturnal insects. A numerous karroo species is *Ptenopus garrulus*, which during the day sits in its burrow uttering a curious, dry, monotonous note, the source of which is often a complete puzzle to the hearer.

The spiny *Agamidæ* are plentiful in dry and rocky places, where they bask in the full sunshine. Seven species of *Agama* are known in South Africa, and of these three are endemic.

Quite similar in habits, and in some cases even more spiny, are the *Zonuridæ*, of which all the four known genera, and eleven out of the fourteen known species, are native; two of the genera and ten of the species being peculiar. The most remarkable member of this family is *Zonurus giganteus*, which, next to the two great Monitors and *Gerrhosaurus validus*, is the largest South-African lizard, and bears a most formidable-looking array of long spines, these being especially well developed at the back of the head and on the tail. This is a native of the northern parts of the Free State, westward from the Natal mountain boundary. A smaller and not quite so prickly species is *Z. cataphractus*, which inhabits the dry karroo country in the west of Cape Colony. A widely-spread lizard of this family is *Pseudocordylus microlepidotus*, common on mountains and rocky hills from Cape Town to the Drakensberg; it presents a great variety of gradations in both

marking and colouring. The endemic genus *Chamæsauro* is remarkable for its snake-like form, the tail being of great length, as well as for the highly variable development of the limbs, one of the three species having both pairs of legs small, but with the usual five digits; the second, *C. anguina*, having the same, but without digits; and the third, *C. macrolepis*, having the hind limbs without digits, while the fore limbs are entirely wanting.

The *Varanidæ* contain many of the largest of existing lizards, commonly known as Monitors. They are widely dispersed through the tropical parts of the Old World, but four only are African. Of the latter two inhabit South Africa, one being the well-known Nile monitor (*Varanus Niloticus*), frequenting African streams generally, and attaining a length of six feet. This species, as it plunges suddenly into the water, is not seldom mistaken for a crocodile; it is naturally more prevalent on the better-watered eastern side of the country. The other kind, *V. albigularis*, seems to have a much more restricted range, inhabiting East and South Africa only. It is not a decidedly aquatic species, like *V. Niloticus*, being often met far from water, mostly in rocky places. Its length does not appear to exceed four and a half feet.

Only two representatives of the *Amphisbænidæ* are native. These extraordinary creatures are limbless (in all but one American species), blind, and without apparent ears; the head is specially formed for burrowing, with the nostrils and small mouth inferiorly situated, and the worm-like body is covered with very small square plates arranged in very numerous rings. *Amphisbæna violacea* is known from Inhambane only, and *Monopeltis Capensis* was discovered by Sir A. Smith towards the eastern side, in latitude 24°.

The *Gerrhosauridæ* are exclusively Ethiopian; three of the five known genera, and eight of the fifteen species, occur in the South, and of these one genus and six species are peculiar. *Gerrhosaurus validus* is, next to the monitors, the largest South-African lizard, being 19½ inches in length. It was first described by Sir A. Smith, who found it near the sources of the Orange River, and it has since been met with at Tette on the Zambesi. In this family, as in the *Zonuridæ*, there is an endemic genus, *Tetradactylus*, the three species of which exhibit great difference in the development of the limbs. The scales of the body in this family are quadrate, and usually form very regular longitudinal and transverse series.

The skinks (*Scincidæ*) are remarkable for having the body protected by bony plates underlying the scales; they have a general tropical distribution in the Old World, a considerable proportion of the known forms being African. They exhibit the tendency to

atrophy of the limbs very strongly; thus in the single genus *Scelotes* the seven South-African species present four different conditions, from very short but complete pentadactyle limbs to none whatever. The last-named condition is also that of the little *Herpetoseps anguinus*, an endemic genus and species recently discovered at Port Elizabeth. Legless also are the three South-African species of *Acontias*, of which the best known is the extremely smooth *A. meleagris*, with the habits and much of the appearance of the European "blind-worm" (*Anguis fragilis*).

The chameleons are unlike all other lizards, and are rightly regarded as constituting a distinct sub-order. Very characteristic are the short neck; deep laterally-compressed body; long thin legs, with the digits unequally arranged to form clasping organs; prehensile tail; granulated and tuberculed skin; large globular eyes covered by a lid only pierced centrally for the pupil; and extraordinarily extensible tongue. Besides the famous power of assimilating their colour to the various tints of their immediate surroundings, they possess another much more remarkable, and indeed absolutely unique among vertebrates, *vid.*: that of moving the eyes separately and independently. The whole tribe is essentially Ethiopian, only three or four stragglers occurring along the Mediterranean and in South Asia; and it attains a striking development in Madagascar, where a peculiar genus (*Brookesia*) and twenty-one species are found. The seven species of the genus *Chamæleon* inhabiting South Africa are all of the smaller kind; the best known is the "dwarf" (*C. pumilus*) abundant about Cape Town. *C. Namaquensis*, which inhabits arid districts of the West, extending as far as Mossamedes, is of a considerably modified "karroo" type; it is by no means so strictly arboreal as its congeners, having stronger legs, and showing much more activity on the ground. It is ordinarily of an inconspicuous greyish brown, with darker spots and blotches, and never exhibits any tinge of green, but in strong sunlight, or when excited, becomes very handsomely pied with white and dark brown in long irregular blotches.

The order of snakes (*Ophidia*) is stated by Boulanger to be not much less numerous than the lizards; of the latter he recognises about 1600 species, and of the snakes about 1500. The whole tribe is pre-eminently one that thrives in a high temperature and copes but ill with any approach to a low one; and accordingly the immense majority inhabits tropical latitudes, the number rapidly diminishing even in the warm-temperate zones, and but very few forms ranging beyond the latter limits. The recorded snakes of temperate South Africa number about fifty, belonging to thirty-four different genera. Five of the nine families are

represented, but nearly four-fifths of the whole, or about thirty-eight, belong to the great family *Colubridæ*, leaving four each to the *Viperidæ* and the *Typhlopidae*, and one each to the *Glauconidæ* and the *Boidæ*. The only genera that appear not to be found elsewhere are both *Colubridæ*, *vid.*: *Lamprophis* (two species) in the sub-family *Colubrinæ*, and *Cyrtophis* (one species) in that of the *Elapinæ*. As far as can be ascertained, in the great paucity of data as to the range of these animals, about twenty species are confined to South Africa.

The worm-like burrowing snakes included in the families *Typhlopidae* and *Glauconidæ* are curious reptiles, rather numerous in the tropics; they much resemble the limbless lizards of several groups mentioned above, being of singularly feeble structure, with small mouths containing very few teeth, and eyes under the ocular shields. The largest South-African species is *Onychocephalus varius*, which was discovered at Sena on the Zambesi, but also occurs at Delagoa Bay.

Very strikingly in contrast with these inert, unfinished-looking little ophidians are the great and powerful boas (*Boidæ*); but an important link between these very dissimilar families is the presence in both of remains of the pelvis and hind limbs. In the boas the extremities of the rudimentary limbs usually protrude just before the base of the tail. The South-African python, or rock snake (*Hortulia Natalensis*), is by far the largest of the native serpents, and, like all its tribe, is very handsome in colouring and marking. Specimens of from fifteen to eighteen feet long are not uncommon, and some of even larger size are reported to have been met with; but it may be fairly suspected that the incomplete skin measuring twenty-five feet mentioned by Sir A. Smith had been considerably stretched after removal from the body. This species is known to extend as far as Mozambique; it is still found in Natal and Zululand, and used to occur in Kaffraria and the eastern districts of Cape Colony.

The *Colubridæ* have been conveniently divided into three series, according to the special character of their teeth: the first (*glypha*) have solid teeth without grooves throughout, and are harmless; the second (*Opisthoglypha*) have some of the hinder maxillary teeth grooved, and are suspected of being venomous to a little extent; and the third (*Proteroglypha*) have the fore-maxillary teeth grooved or perforated, and are certainly venomous. Twenty-one of the South-African Colubrine snakes belong to the first or innocuous series, and seven others to the latter suspected series, while the remaining ten or eleven are remarkably provided with grooved poison fangs in front. The latter series includes the sub-families *Colubrinæ* (19) and *Dasy-*

peltinæ (2); the second, the *Dipsadinæ* (7); and the third, the *Elapinæ* (9).

The Colubrinæ include the large and abundant "black" "mole" snake (*Coronella cana*), and its close ally *C. phocaris*, the latter confined to Robben Island in Table Bay. The endemic genus *Lamprophis* includes, besides its type *L. Aurora*, a very handsome little species, *L. Fiski*, golden-yellow with black spots only known to inhabit the neighbourhood of Town's River in the lower karroo. *Psammophylax rhombeatus* is widely distributed in South Africa; it is a very active snake, and has perhaps gained its local name of "schaapsticker," or "sheep-stinger," from its general resemblance to the venomous *Causus rhombeatus*, one of the *Elapinæ*, a species very likely to resent the intrusion of trampling sheep on its favourite haunts.

That many snakes have a taste for birds' eggs is notorious, in Africa possesses a few species pre-eminently adapted for this kind of food; they form the small sub-family *Dasypeltinæ* (or *Rachidontinæ*). In the three kinds known, the ordinary (maxillary) teeth are minute and very few, so that they do not fracture the shell of an egg taken into the mouth; but, strangely enough, at about two inches behind the head, a series of the inferior processes of the vertebræ project into the gullet, and when the egg reaches these the constriction of the neck muscles enable them to crack the shell without risk of losing any of its contents. Of the two South-African species, *Dasypeltis scabra* is the commoner; and there is an example in the South-African Museum which was caught with an ordinary hen's egg three-parts swallowed. Extraordinary as is the distension which the jaws and skins of snakes will undergo, the disproportion between the normal size of this little creature's head and the egg is so immense that it is almost incomprehensible how the jaws could by any efforts contrive to "get outside" the morsel they had gorged. In this instance I thought it highly probable that the *Dasypeltis* had overrated its powers, and was actually choked by its boot being unable to bring its gular teeth to bear with effect on the large and thick an egg-shell.

Of the South African *Dipsadinæ* the most notable is the fiercest and active "boomslang" (*Bucephalus Capensis*), which varies greatly in colouring and marking. It is a common and widely spread species, frequenting trees and bushes in its pursuit of birds which recognise it as an enemy, and often "mob" it with loud cries. No venom-gland is to be found in this species, but the elongated grooved hind teeth certainly favour the view that besides being serviceable in merely retaining a struggling prey they probably inject at the same time some poisonous fluid.

The truly venomous colubrine serpents are the *Elapinae* and the *Hydrophinae*, with fully-developed poison glands communicating with the grooved front maxillary teeth. The former include among them the cobras or hooded snakes, of which the widely-spread African species, *Naja haje*, is common in the southern parts. It attains a length of from five to six feet, and varies in colour from straw-yellow, or almost golden-yellow, through several tints of mottled brown, to quite black. Its activity, strength, and boldness, and the known deadliness of its bite, render it justly dreaded.

Dendraspis angusticeps, the "mamba" of Natal and Zululand, is still larger than the ordinary cobra, reaching the great length of ten feet. More of a tree snake than its ally, it is remarkably swift in its movements, and of fierce temper; and cases of speedy death from its stroke are well authenticated.

The "ringhals" (*Sepedon hæmachates*) is very generally distributed over South Africa, to which it appears to be peculiar, and is well known as a most alert and pugnacious snake. When excited it erects its anterior part and partially inflates the neck, like a cobra; keeping the mouth open and the fangs raised, it strikes repeatedly and with great force. It also has the habit of ejecting to some distance an acrid saliva (with which some venom from its copious supply is probably mingled), and has thus gained another local name, "spuughslang."

Aspidelaps lubricus and *Cyrtophis scutatus* are related forms apparently endemic—the latter, indeed, which extends from Kaffraria to Inhambane, constituting a peculiar genus. Several species of *Elaps* occur; they are singularly sluggish, have very small mouths, and seem very disinclined to use their fangs. In *Atractaspis irregularis* the fangs are prolonged so far backward, and the mouth orifice is so small, that it is clear these weapons cannot be used to strike in the ordinary way.

Only one of the sea-snakes (*Hydrophinae*) is known to reach the Cape, *vid.*: *Pelamis bicolor*, the most widely ranging of that most singular group, which mainly inhabits the tropical shores of the Indian and Western Pacific Oceans. They are readily recognised by their laterally-compressed oar-like tails; all those known are venomous. *P. bicolor* has been recorded from such extreme distances apart, as the Persian Gulf, Japan, New Zealand, and Central America; stragglers not seldom occur on the Cape coast as far as False Bay.

While most of the venomous Colubrine snakes have nothing repulsive in their appearance or physiognomy, there is something in the whole aspect of the *Viperidae* that at once arouses a feeling of dread and disgust, and certainly the flattened backwards

broadened head has an expression which, for concentrated malignity and dull ferocity, has no equal throughout nature. The larger forms, such as the puff-adder (*Vipera arietans*), the West-African *V. nasicornis* and *V. rhinoceros*, the *V. Russellii* of India, and the rattlesnakes of America, are as deadly as the cobras, and are perhaps more dangerous to man, on account of their sluggishness by day. This inertness often leads to their being trodden upon—an accident which they instantly resent with murderous effect. The fangs of the vipers are much longer than those of the Colubrine venomous snakes, and retain their hold with far more tenacity. In South Africa the stroke of the puff-adder has in many cases proved fatal to man. The smaller Cape vipers are *V. Atropos*, known as the "Berg adder," a common species in mountainous localities; *V. inornata*, a scarcer form inhabiting arid tracts; and the little *V. cornuta*, also a lover of dry and sandy places, whose aspect is rendered especially forbidding by two pointed crests of scales immediately above the eyes, earning for it the local title of "hornsman."

AMPHIBIANS.

The Amphibians or Batrachians of South Africa are far from numerous; the twenty-nine species recorded all belong to the tail-less or leaping order (*Salientia*). While there is a considerable proportion (fourteen) of peculiar species, the only peculiar genus appears to be *Cacosternum*. Four of the fourteen recognised families are represented as follows, *vid.*: *Ranidæ*, or typical frogs, seven genera and twenty species; *Engystomatidæ*, four genera and five species; *Bufo**nidæ*, or toads, one genus and three species; *Dactylethridæ*, or clawed-toads, one genus and one species.

The largest South African frog is *Rana adspersa*, the "bull-frog" of the colonists, a very robust species attaining the length of six inches. Its head is large, and the under jaw has two large bony prominences in front. Its deep hoarse note is a familiar sound of the summer night in the eastern districts of Cape Colony where this frog has the evil reputation of swallowing newly-hatched ducklings. The species extends to the Zambesi and to Mozambique.

Rana Grayi and *R. fasciata* are two species peculiar to the South; the latter is very remarkable for the extraordinary length of the fourth toe of the hind-foot, which is very nearly as long as the body.

Next to *Rana* in the number (five) of its South-African representatives comes the genus *Rappia*, confined to the Ethiopian region. These little tree frogs have the toes dilated at the end

into disks which enable them to adhere securely to any surface, however smooth and flat,—some species having another adhesive disk covering the throat. They frequent leaves and flowers, and several of them have the power of changing colour in accordance with altered surroundings. *R. marmorata* is an abundant species in Natal, and extends right through Africa as far as Abyssinia and the Gambia; it is amazingly variable in its markings, and has received on this account a dozen or more different names. This species and *R. Horstockii* (which is common in Cape Colony) are fond of sitting on the leaves of reeds and grasses in swampy spots.

It is in the family *Engystomatidæ* that South Africa exhibits peculiarity, four of the five species being endemic, and one of these, a small Kaffrarian form, being the type of a new genus, *Cacosternum*, described by Boulanger in 1887. *Phrynomantis bifasciatus* inhabits tropical and parts of temperate South Africa; it frequents hollows under the bark of trees, and has the toe expansions so frequent in arboreal batrachians. The genera *Breviceps* (2 South African species) and *Hemisus* (1 species) belong to the burrowing portion of the family, and only appear above ground after very wet weather. *Breviceps gibbosus* and *B. verrucosus* are by no means uncommon, and are the oddest little figures imaginable, with their globular bodies, extremely short legs, and blunt little head projecting very little beyond the general rotund outline. When irritated these animals inflate themselves to the utmost, and exude much moisture from their skin. *Hemisus guttatum* inhabits Natal; it has much the appearance and habits of *Breviceps*, but is readily distinguished by its rather long acute snout and much longer hind-legs.

Of the *Bufo*idæ South Africa possesses three species, all belonging to the genus *Bufo*. The moderate-sized small-headed *B. carens* is endemic; it is very rare, and was discovered by Wahlberg in the interior somewhat north of Cape Colony. The smaller *B. angusticeps* is not uncommon, and extends to the Zambesi. The third species is the large and handsome *B. regularis*, long known under the appropriate name of *B. pantherinus*, which occurs in all parts of Africa, but is nowhere so big and so distinctly marked and coloured as in the South.

The tongueless Batrachians form a separate Sub-Order, and among other special characters have the unique one of claws on three of the hind toes. A very small number are known; they are natives of Africa and tropical South America. The three African species belong to the genus *Xenopus*, and, while all inhabit the tropical zones, one only, *X. laevis*, extends to the South, where, however, it is very common and generally distributed, flourishing in every pool. This curious batrachian

attains to a good size, and its muscular hind-legs are said to be worthy the respectful attention of the epicure when treated by a competent *chef*. The tadpoles of *Xenopus* are singular in possessing a spiracle on each side of the body, and a pair of long barbs depending from the lower jaw.

FISHES.

The paucity of Freshwater Fishes in temperate South Africa is very remarkable; undoubtedly the scarcity of permanent rivers and lakes is the main cause of this, but it hardly seems enough to account for the extreme poverty of the country both in genera and species. It is not improbable that some of the native kinds remain undiscovered. At present the contrast between South African and Tropical Africa is most striking, although the latter cannot be called very rich considering its immense area. About 250 species are known from Tropical African fresh waters, and even from so near as the Zambesi river, thirty-two are recorded; but as far as I can discover, only fourteen South-African species belonging to five genera and representing no more than four families, have been found. It is some consolation to note that two of the genera (*Spirobranchus* and *Abrostomus*), and all the species appear to be peculiar. Günther has pointed out that the few forms known are intimately related to those of Tropical Africa, whereas the Marine Fishes of the Cape distinctly belong to the south temperate zone, with only a few additions from the adjacent tropical shores.

Among the three spiny-finned fishes, *Spirobranchus Capensis* is a most interesting little species. It belongs to the family called *Labyrinthici*, from the possession of a complicated accessory breathing-organ, in the cavity of which they can retain a little water, enabling them to live for some time in the open air, or enclosed in dried mud. *Spirobranchus* is a near relative of the celebrated "climbing perch" (*Anabas scandens*) of India, but does not appear to emulate that species in walking or clambering about on dry land. It abounds in rivulets and pools, and meets their drying-up very philosophically.

The two other South-African Acanthopterygii belong to the *Chromides*, a family containing a good many tropical species; they are *Chromis Sparrmanni*, a small species with prettily coloured and spotted fins, inhabiting streamlets to the north of the Orange river, and *Hemichromis guttatus*, of about the same size, described by Günther, from some part of the Cape Colony, not recorded. The latter may be recognised by having the two outer ventral rays produced into filaments.

The great group of the *Siluridæ*, or "cat-fishes," is represented by *Clarias Garieppensis*, the only South-African freshwater fish that attains a considerable size. This creature, known as "plattekop," loves the mud, and is common in deep pools of the Orange and Vaal rivers as well as of minor streams on the eastern coast. Like nearly all the tribe, it has rather a forbidding aspect, with its scaleless slimy body, and broad flat bone-plated head bearing eight barbules. Burchell, the discoverer of this fish, describes its flesh as white, rich, and nutritious. It is stated to be sometimes met with over four feet in length.

The remaining freshwater fishes are of the soft-finned order, and belong to the *Cyprinidæ* or carp family,—two to the peculiar genus *Abrostomus*, and eight to the very large and widely-distributed genus *Barbus*. All of them have their barbules dependent from the upper jaw. The two species of *Abrostomus* inhabit the deeper pools of streams, and are said to keep to the mud as closely as the "cat-fish" just mentioned. They are not considered worth eating; but two of the larger kinds of *Barbus*, which have the same habits—*B. Capensis* and *B. Mariquensis*—are tolerable as table fish. The little *B. Burchelli* and *B. pallidus*, commonly known as "carp" and "minnows," frequent clearer streams in plenty, but their size is too diminutive (about 4 inches and 2½ inches long respectively) to tempt the angler; the former species is distinguished by the fins being bright red at their base.

The eels (*Murænidæ*) are not considered to be part of the strictly fresh-water fishes, but rather to belong to the debatable brackish-water series, consisting mainly of marine forms of which some have more or less completely habituated themselves to fresh water. Many of the species of *Anguilla* seem, however, to be perfectly at home in the latter, ascending even to the sources of the smallest streamlet, although never known to spawn in fresh water. Two river-dwelling species are recorded as South-African, *vid.*: *A. labiata* from Natal, and *A. Delalandii* from the Cape Colony. It is stated that in South Africa these fishes occur only in rivers flowing and debouching eastward; and so strange are the apparent irregularities in the distribution of many of the species that this would be by no means incredible; but it may be mentioned that a very fine specimen (I believe of *A. Delalandii*) was captured in the insignificant Liesbeek stream, close to Cape Town, which runs into Table Bay, as recently as December, 1891.

In concluding this necessarily most imperfect sketch of the South-African Vertebrate Fauna, it is matter for congratulation to record that the people of Cape Colony have of late years become

alive to the alarmingly rapid disappearance of the larger game animals, including birds; and that laws of increasing stringency have successively been passed by the Legislature, not only providing a close season for all the surviving species, but absolutely prohibiting any slaughter of the rarer kinds needing special protection—and in some desperate cases of all game—in certain districts for terms varying from one to three years. Though it is unfortunately only too certain that this enlightened legislation has come too late to save many of the finest native forms from extinction, yet the good effect of these measures is already appreciable in those districts where the residents possess sufficient sense and activity to observe and enforce them. Another most promising project is the restocking of our desolated hills and plains with the more valuable antelopes, such as the eland, hartebeest, koodoo, gemsbok, bontebok, blesbok, and springbok; experiments here and there having amply indicated that nothing more is needed in most cases but abstinence from persecution and slaughter for a few years—this protection being largely aided by fencing in the more extensive lands on which the animals are placed. Nature will not, indeed, “bring back the mastodon;” and where absolute extinction of any species throughout its range has unhappily occurred we can only submit to the consequence of our misdeeds; but there is nothing to prevent re-introducing surviving species into country where they were formerly indigenous, and so restoring one of our most characteristic surroundings to something of its original beauty, and atoning to some extent for the senseless destruction of some of the noblest forms in creation.

CHAPTER IV.

THE FLORA OF SOUTH AFRICA.*

BY HARRY BOLUS, F.L.S.

EVER since the time of its first settlement the Cape has been a constant source of pleasure and delight to the botanist and the gardener. Though Cape plants have somewhat gone out of fashion of late years, it is still probably true that no single country in the world has contributed so largely to European conservatories and gardens as the Cape of Good Hope. The despatch of plants, indeed, began before the settlement by Van Riebeeck, for we find that one Heurnius, a missionary *en route* to the East, had sent to his brother at Leyden several curious plants which were figured by Stapel in his edition of Theophrastus' History of Plants, published at Amsterdam in 1644. These are the earliest known figures of Cape plants, and amongst them was the well known *Oriza variegata* of the Lion's Rump, which was called a Fritillary, and an *Oxalis* which, with equal reason, was styled a Trifolium! But those were the days before Linnæus had arisen with master mind to reduce to order the rapidly increasing stores of vegetable forms. In 1772 came Thunberg, the father of Cape Botany; in 1810, Burchell; in 1825-1834, Ecklon, Zeyher and Drège. All these made journeys of thousands of miles, and of several years in duration, exploring the vegetation of the country. Besides them were others of less note, and a host of gardeners and collectors of seeds and living plants. From 1775 to 1835, Cape plants may be said to have been quite the rage. The conservatories, temperate houses, and gardens of England and the Continent teemed with the Pelargoniums, Heaths, Proteas and other handsome flowering shrubs, and the lovely bulbous plants of Iridææ, Amaryllidææ and Liliacææ; and the pages of the Botanical Magazine and other similar periodicals were filled with figures and descriptions of them.

The public taste of that day was amply justified. Perhaps the recently increasing exportation of flowering bulbs may be taken as an indication that the fashion will be revived. But though fashion

in flowers may be variable, the interest of science is more permanent; and notwithstanding the diligent exploration of the count for the last hundred years, the constant discovery of new forms even up to the present day, has largely occupied the attention of systematic botanists.

Without the means, in the present state of our knowledge, precisely comparing the relative number of species of flowering plants in this, and any other portion of the earth's surface, enough is known to enable us to say that South Africa ranks amongst the richest of regions. But if we ascend to those higher systematic groups called Genera and Orders, we can speak with a great approach to accuracy. These may be compared in two ways. First, for the sake of the general reader, the numbers of these in South Africa (and by the term South Africa let it be understood that I mean always Africa south of the Tropic of Capricorn) may be compared with the known total for the whole world. The latter is taken from Bentham and Hooker's *Genera Plantarum* (*Journal of Botany* xxi, 156):—

Whole World	Orders 200 :	Genera 7569
South Africa	„ 142 :	„ 1255

Secondly, we may compare South Africa with another country, in the same hemisphere, for the most part in the same temperate zone, and of which the Flora is about as well known as that of South Africa, *e.g.*, Australia.

I take the figures for the latter from Sir J. D. Hooker's well known Essay: *On the Flora of Australia* (London, 1859). And we have the following result:—

Australia	Orders 152 :	Genera 1300
South Africa	„ 142 :	„ 1255

The area, however, of Australia is five times larger than that of extra-tropical South Africa; and what is of more importance is the fact that its eastern coast line runs up into the tropics to nearly the 10th degree of S. latitude. It will be evident, therefore, how much richer in variety of forms, relatively to area, the Southern extremity of the African continent, than that of Australia.

There is another interesting point in the number of endemic genera in each area, that is, of genera exclusively restricted to each country. In Australia these are about 520 (Hooker); in South Africa 446.

Why South Africa should be so rich in vegetable forms, is a question which cannot yet be fully answered. Proximate causes appear to be

- (1) The meeting and partial union of two (perhaps three) distinct Floras of widely different age and origin.
- (2) A highly diversified surface of the land and of soil.
- (3) A climate with much sunlight (or little cloud); a condition which seems everywhere favourable to the multiplication of forms.

No one could form an adequate or accurate conception of the Flora of South Africa who should regard it as a single Region. Meyer and Drège (*Comment. de Plant. Afr. Austr. Lipsiae*, 1835) divided the Colony south of the Orange River and Natal, into five Regions, and numerous districts and sub-districts. The value of Drège's observations cannot be over-estimated, and form the necessary basis of all later investigations; but the divisions were too numerous, and broad distinctions were over-loaded with a mass of subordinate detail. Grisebach (*Vegetation der Erde, Leipzig*, 1872) regarded the Colony proper as far eastward as the Kei River, as forming one Region: the "Cape"; eastward of this he brought down the continuation of his vast "Soudan Region," and north of the Orange River, he constituted his "Kalahari Region" out of Great Namaqualand, Damaraland, Bechuanaland, &c. As far as they go, and except for the error in supposing the Orange River to be a floral boundary, these Regions appear to me to be natural. But Grisebach's "Cape Region" cannot possibly be regarded as one; it must be divided into two at least; and perhaps with more propriety into three. The Flora of the karroo of the Cape may probably prove to be more distinct from that of the South-western portion of the Colony, than is the latter from that of Australia.

I propose, therefore, to regard South Africa as including five natural Regions, two of which extend beyond its limits, while the others are included within them. These are:—

- (1) The South-Western Region
- (2) The Tropical African " (Grisebach's "Soudan")
- (3) The Karroo "
- (4) The Composite "
- (5) The Kalahari " (Grisebach)

THE SOUTH-WESTERN REGION.

It is the South-Western Region which has for the most part furnished that large quantity of garden plants which I have referred to above, and which is the home of what has been for the last hundred years popularly known as the Cape Flora. It is an angular littoral strip, bounded on the west coast by the Olifant's River and the mountains near it, but including properly the

mountain range from Cedarbergen up to the Khamiesbergen; on the east by the Van Staden's mountains; and inland by considerable mountain chains under various names. Its greatest width does not exceed eighty miles, and probably averages not more than fifty miles. The inland mountain chains referred to may average 4000 feet in height, attaining sometimes (Great Winterhoek) 6800 feet. The surface of the Region is extremely diversified; sandy and bushy tracts alternating on the coast with grassy downs, and vast mountain slopes of the most barren appearance when lying a short distance inland, but clothed with an immense variety of small plants.

The soils are varied, the exposed rocks being chiefly granite clayslate (Malmesbury beds: Silurian?) and sandstone (Table Mountain Sandstone: Devonian); with insignificant exceptions tertiary deposits are absent, occurring only in low places and at shallow depths. Throughout South Africa the influence of soil upon the distribution of plants appears to be less important than that of climate and exposure.

Rivers are few, and badly supplied with water except in winter. practically, none of them are navigable.

The mean annual temperature of Cape Town is 16.25° C. (61.25° Fahr.); of the six summer months 20° C., and of the six winter months 12.5° C.; the mean annual humidity of the atmosphere 71.83 per cent.; the mean annual rainfall in the city itself is 23.80 inches; but in the suburbs it reaches in some localities to 60 inches. Further inland the temperature is higher, the extremes greater, and the humidity and rainfall much less. At Worcester, situated about 60 miles from Cape Town, the mean annual temperature rises to 16.93° C.; the humidity is 54.40 per cent.; and the average rainfall is 12.47 inches. About two-thirds of the whole rainfall takes place during May, June, July, and August; and the months of January to April are usually very dry. The whole rainfall of this Region attains its maximum near Cape Town; and diminishes rapidly as we proceed northward up the west coast.

The prevailing aspect of the vegetation of this and the two next Regions, thus of the whole Cape Colony except the eastern coast region, is that of a number of low-growing scattered shrubs of a dark or bluish green hue. With considerable exceptions this is, nevertheless, the appearance which most commonly meets the eye. Almost everywhere the "bush" is present. There are vast tracts called the "Boschjesveld" (bush country), from the uniformity of this appearance. There, the chief bush is the "Rhenosterbush" (*Elytropappus rhinocerotis*); but these are intermingled with others, and in general they belong to the most various Orders. All have

usually very small leaves, or of greyish green colour, or so covered with a dull coloured indument, as to produce at a distance a generally sombre aspect. On the coast the bushes are larger, ranging from 4 to 8 feet. The following genera are some of those which by their abundance largely contribute to make up the floral landscape:—*Mundtia*, *Pelargonium*, *Agathosma*, *Celastrus*, *Cassine*, *Phyllica*, *Rhus*, *Cyclopia*, *Borbonia*, *Aspalathus*, *Cliffortia*, *Berselia*, *Brunia*, *Staavia*, *Tetragonia*, *Aster*, *Athanasia*, *Stoebe*, *Metalsia*, *Erica*, *Simocheilus*, *Myrsine*, *Euclea*, *Lycium*, *Lobostemon*, *Salvia*, *Penæa*, *Passerina*, *Leucadendron*, *Protea*, *Leucospermum*, *Serruria*, *Myrica*, &c. Interspersed among these are numerous plants of the orders *Orchideæ*, *Irideæ*, *Amaryllideæ*, *Liliaceæ*, with scattered tufts of *Restiaceæ*, sedges, and grasses.

In the deep ravines of the mountain sides are dwarf trees, growing closely, with dark foliage. Few indigenous trees attain a greater height than 25 to 30 feet; and amongst these is the remarkable and very characteristic Silver Tree (*Leucadendron argenteum*), occurring almost exclusively on the Cape Peninsula. Forests are only met with towards the Knysna and Zitzikamma. These are chiefly composed of species of *Podocarpus* (Yellowwood), *Ocotea* (Stinkwood), *Ptæroxylon* (Sneezewood), *Olea* (Olive), *Elæodendron* (Saffronwood), *Cunonia* (Rood Els), *Virgilia* (Keurboom), *Olinia* (Ironwood), *Cussonia*, *Ficus*, *Grewia*, *Curtisia*, *Sideroxylon* (Milkwood), *Rhus*, &c., &c. Those of which the vernacular names are quoted yield excellent timber. Trees of the *Podocarpus* occasionally attain a height of 50 to 60 feet; but few of the others exceed 25 to 30 feet.

There is little change in the aspect of the vegetation even at greatly varying heights on the mountains; and near the coast especially it is much less affected by altitude than is the case in Europe. On Table Mountain some species are found from the bottom to the top, having thus a vertical range of 3500 feet; and there are many with a range of from 1000 to 2500 feet.

The flowering season begins about the end of May immediately after the first winter rains. The numerous species of *Oxalis* first made their appearance, and these are soon followed by great numbers of *Irideæ*, *Amaryllideæ*, *Liliaceæ*, and other bulbous plants, besides *Mesembryanthemums* and various *Compositæ*. On the mountains the flowering begins later and continues longer; but though few plants may be found in flower in March and April, yet they are never wholly absent. The imported oak has shed its leaves for a period of six or eight weeks only (during May and June) before the new growth begins. Everything points to the fact that the true winter, the period of rest, is here the dry season, viz., March—May; as soon as rain falls

even the winter temperature is sufficient, and vegetable life is at once aroused to activity.

A few of the most beautiful, striking, or curious vegetable forms of the region may here be mentioned, the majority of the examples being taken from the highly representative and rich flora of the Cape Peninsula, lying on its western extremity. The palm of beauty must be awarded to the *Disa grandiflora*, the grandest of southern terrestrial orchids, as *Cypripedium spectabile* is of the northern hemisphere. This is abundant on the streams of Table Mountain, and is found also on the Hottentot's Holland mountains thirty to forty miles inland. Other fine orchids are *Satyrium corifolium*, a brilliant orange, *S. carneum* and *S. erectum*, *Disa longicornis*, a lovely blue, *D. secunda*, the delicate white *D. fasciata*, and others; *Pterygodium acutifolium*, a fine deep golden yellow *Ceratandra chloroleuca*, and *C. Harveyana*; the brilliant blue *Disa* (Herschelia) *graminifolia* (long known as *H. coelestis*) and the allied *D. venusta*, and *D. purpurascens*; and, finally, the small beautifully fringed spider-like *Bartholina pectinata* and *B. Ethelae*. Close upon these presses the so-called "Arum," the *Richardsonia africana*, with its pure white spathe,—almost as common an ornament of all moist low-lying ground as the common dock is an accompaniment of English ditches. The Proteas are universal objects of admiration, and few things can surpass *P. cynaroides* with its flesh-coloured involucre, *P. speciosa*, *P. coccinea*, and a few others. The singular *Leucadendron argenteum*, or Silver Tree, is a striking ornament of the mountains about Cape Town. Next come the Heaths, whose names would be legion. The most beautiful, and those with the largest flowers, are denizens of the mountains lying between the Hottentot's Holland range and the town of Swellendam, being especially abundant about Caledon and Genadendal. On Table Mountain, *Erica cerinthoides*, *E. mammosa*, *E. coccinea*, *E. spumosa*, and *E. hirta* are amongst the finest, the latter sometimes making a whole mountain side glow with its warm pink tints. There are, probably 350 species of true heaths found in this Region alone. Amongst Compositæ, *Gazania* has some fine species, while *Helichrysum vestitum*, *Helipterum*, spp., and *Phenacomia prolifera*, are amongst the showiest of the everlasting flowers, the heads of the first-named being gathered, dried, and exported in large quantities to Europe as *immortelles*. *Dimorphotheca annua* has gay white rays, and, with some species of *Arctotis*, makes the fields look bright in spring. In the large Order, Leguminosæ, *Podalyria calypttrata*, with its large rosy flowers, may, perhaps, head the list, and *Virgilia Capensis*, *Cyclopia* spp., *Hypocalyptus obcordatus*, and the widespread *Sutherlandia frutescens*, are amongst the few handsome plants of an Order not remarkable for

its beauty in this Region, but which consists for the most part of inconspicuous shrublets. The Acacias are deficient; only *A. horrida* occurring sparingly in the drier parts of the Region. The Pelargoniums are abundant, and several species, *P. cucullatum*, *P. latifolium*, &c., are very handsome. Oxalises with white, red, and yellow flowers, stud the fields in early spring. The numerous species of the tribe Diosmeæ, including *Diosma*, *Barosma* (some of which, as *B. crenulata*, &c., furnish the Buchu of medicine), *Agathosma*, *Adenandra*, &c., are mostly confined to this Region. The attractive *Rochea coccinea* is one of the chief ornaments of Table Mountain; while the Cotyledons contribute some of the most curious plants of the Region, especially *C. fascicularis*, with its smooth, thick, swollen tree-like stem; very abundant in the neighbourhood of Worcester and Hex River. Near the Tulbagh Waterfall occurs the rare and pretty *Ixianthes retzioides*, and in the same neighbourhood, the curious *Roridula dentata*, a shrubby Droseraceous plant with extremely viscid leaves, which the farmers hang up in their houses in order to catch flies. The showy *Polygala oppositifolia* and *P. myrtifolia* are both widely distributed. Plants parasitic on the roots of others take a prominent position in our Flora. They include several handsome Harveysas, white, purple, and orange; and in other orders the *Cytinus dioicus*, the curious *Hydnora africana*; the foul-smelling *Sarcophyte sanguinea* and *Mystropetalon* spp. Labiatae are not plentiful, but *Salvia paniculata* and *S. nivea* are fine species. Turning to the *Monocotyledons*, Orchideæ have already been mentioned; Iridæ are abundantly represented in handsome species of *Romulea*, *Geissorhiza*, *Ixia*, *Gladiolus*, *Watsonia*, *Babiana*, &c.; Amaryllideæ in *Amaryllis*, *Belladonna*, *Nerine*, *Brunsvigia*, *Vallota*, &c.; Scitamineæ in the peculiar and noble *Strelitzia*. Liliaceæ are very varied and numerous. The most conspicuous are the Aloes,—*A. plicatilis* with an arborescent trunk, attaining a height on the western mountains of 12 to 15 feet; the beautiful blue *Agapanthus*; the star-like *Ornithogalum*s; *Kniphofia alooides*, and many others. *Prionium palmita* is a remarkable plant with the flower of a *Juncus*, and the habit of a pine-apple, which in some parts fills the beds of certain western rivers, and reaches a height of eight or ten feet. Some Restiaceæ and Cyperaceæ attain to six or seven feet, and often form a striking feature in the landscape. Ferns are not very abundant, chiefly occurring in the deep ravines, where the arborescent *Hemitelia Capensis* is found several feet in height; and *Todea africana* forms a handsome plant. *Osmunda regalis* is sparingly met with, while *Pteris aquilina* is more commonly scattered on the open hillsides.

It is in the orders and genera of plants exclusively or chiefly

found here that the most striking differences are to be found between this and the other Regions of South Africa. An immense mass of observations has been collected, but has not yet been tabulated. It must suffice to say that this Region is distinguished by the comparative abundance of the Orders: Rutaceæ, Bruniaceæ, Ericaceæ, Penaceæ, Proteaceæ, Iridæ and Restiaceæ; by the tribe Stilbæ of the Order Verbenaceæ; and by the large proportionate number of the following Cape genera, of those richest in species, belonging to other Orders: Pelargonium, Oxalis, Phyllis, Aspalathus, Cliffortia.

The following list of the sequence of Orders according to the numbers of species of each is chiefly based upon Drège's collections which were very large and general. He, however, or rather Ernst Meyer, considerably over-estimated the number of species both of Restiaceæ and Iridæ; and to follow his results implicitly would be misleading. I have therefore framed the following list in which the position of those Orders has been reduced:—

- | | |
|---------------|--------------------|
| 1. Compositæ | 8. Cyperaceæ |
| 2. Leguminosæ | 9. Restiaceæ |
| 3. Ericaceæ | 10. Liliaceæ |
| 4. Proteaceæ | 11. Orchidæ |
| 5. Iridæ | 12. Rutaceæ |
| 6. Geraniaceæ | 13. Scrophularineæ |
| 7. Gramineæ | |

The fact of five such Orders as Ericaceæ, Proteaceæ, Iridæ, Geraniaceæ, and Restiaceæ, occupying so high a position, is sufficient to stamp this Region with a character peculiarly its own.

Very remarkable is the deficiency of Rubiaceæ. This Order, which is the fifth natural Order of the World, and the second of India, does not only not find a place in the above list, but actually constitutes less than one per cent. of the total Flora. The following large Orders are also very poorly represented: Myrtaceæ, Aroidæ (each 1 species); Laurineæ (3 sp.); Acanthaceæ, Labiatæ and Asclepiadæ.

No trustworthy calculation of the number of species occurring in the Region is available. Drège collected 2914 species; I should estimate the total at about 4500 species. The richness of certain localities is very great. On the Cape Peninsula alone, an area about one-fourth larger than the Isle of Wight, I have collected ninety species of Erica, and one hundred and twelve species of Orchidæ have been recorded; and the total number of species of flowering plants is probably nearly two thousand.

The affinities of the Flora of this Region with that of Australia,

especially of South Western Australia, are very striking, and have already been shown by Sir J. D. Hooker (*loc. cit.*), from the Australian point of view.

Two very distinct Orders, Proteaceæ, and Restiaceæ, are abundant in both regions, and, except for a few outliers, do not occur in any other countries: yet they have no single species, and only two or three genera, in common, out of many. Proteaceæ form the third Order of the Australian Flora, and the fourth of this Region. Diosmeæ, a large tribe of Rutaceæ abundant in this Region, find a counterpart in Australia, in the tribe Borneiæ of the same Order. The tribe Ericææ of the Order Ericaceæ, has over 400 species in this Region alone: not one occurs in Australia, but the place of the tribe is taken by the large Order Epacrideæ, closely allied to it, and which is almost confined to Australia.

The following table of the nine largest Australian Orders is taken from the same source, and is compared with the preceding list of the Orders of this Region. I carry the latter up to twelve, not being quite sure of the sequence of the smaller orders:—

<i>Australia.</i>	<i>S.-W. Region, S. Africa.</i>
1. Leguminosæ.	Compositæ.
2. Myrtaceæ.	Leguminosæ.
3. Proteaceæ.	Ericaceæ.
4. Compositæ.	Proteaceæ.
5. Gramineæ.	Iridæ.
6. Cyperaceæ.	Geraniaceæ.
7. Epacrideæ.	Gramineæ.
8. Goodenoviæ.	Cyperaceæ.
9. Orchideæ.	Restiaceæ.
	Liliaceæ.
	Orchideæ.
	Rutaceæ.

The number of identical genera in the foregoing orders is extremely small. Of species, not one is known to be common to both Regions. There is no genus of Rutaceæ or Proteaceæ; and only three of Restiaceæ (*Restio*, *Leptocarpus*, *Hypolaena*) common to both Regions. In other Orders the number of identical genera, if we except those of world-wide distribution, is extremely small. The following in Compositæ have been pointed out by Bentham (*Linn. Soc. Journ.* xiii, 552):—

<i>Brachycome</i>	1	South African	36	Australian species
<i>Helipterum</i>	12	"	30	"
				H 2

Helichrysum	137	South African	52	Australian species
Cassinia	1	"	13	"
Athrixia	6	"	5	"
Cotula	22	"	9	"

besides the cosmopolitan genera *Senecio* and *Gnaphalium*. Not all of these South-African genera belong to this Region, nor any of them exclusively so; but *Helipterum* is very nearly restricted to it, while *Helichrysum* is widely distributed over the whole of Tropical as well as Southern Africa, though chiefly abundant in the latter. On this subject Bentham remarks (*l.c.* 553):—"This approximation of the Compositæ of Australia and South Africa may possibly date from times less ancient than those in which they established a communication between the New and the Old World; and it may even have been less remote than the period in which flourished the common parents of Australian and South-African Proteaceæ and Restiaceæ, or of Australian Epacrideæ and South-African Ericææ; for it is exemplified not in tribes only, but also in identical genera and sections." Amongst Liliaceæ may be mentioned the recent discovery in this Region of *Nanolirion*, a close ally of *Herpolirion* hitherto only found in similar alpine situations in Australia, Tasmania, and New Zealand.

The following Orders, characteristic of Australian vegetation, abound most, after Australia, in South Africa: Thymeleæ, Haemodoraceæ, Droseraceæ (Hooker); and another point of approach is found in the remarkable deficiency in both countries of the widely diffused Orders, Rubiaceæ, Laurineæ, and Aroideæ.

On the other hand there are certain remarkable divergencies, as pointed out in the following list, taken with modifications from Sir J. Hooker's Essay before quoted.

The following Orders are represented in the Flora of this Region, but are either comparatively rare or absent in Australia :—

Fumariaceæ, absent in Australia	Ericææ, absent in Australia
Geraniaceæ.	Selaginææ, ditto
Caryophyllææ.	Stilbææ (tribe <i>Verben.</i>) ditto
Rosaceæ (Cliffortia).	Penæaceæ ditto
Bruniaceæ, absent	Podostemaceæ ditto
Crassulaceæ.	Cytinaceæ ditto
Dipsaceæ, ditto	Piperaceæ ditto
Campanulaceæ.	Aloinææ (tribe <i>Liliac.</i>) ditto

Temperate Australia contains the following orders that are rare or absent in this Region :—

Dilleniaceæ, absent in S. Africa	Epacrideæ, absent in S. Africa
Magnoliaceæ, ditto	Loganiaceæ

Tremandreae, absent in S. Africa	Myoporineae, absent in S. Africa
Stackhousiæ, ditto	Mouimiaceæ, ditto
Sapindaceæ.	Casuarineæ, ditto
Haloragææ.	Cupuliferæ, ditto
Myrtaceæ (1 species)	Coniferæ
Caprifoliaceæ, absent	Johnsoniæ (tribe of <i>Liliac.</i>) do
Stylidiæ, ditto	Xeroteæ (tribe of <i>Juncac.</i>) do
Goodenoviæ, (1 species)	

It is also noteworthy that whereas in the Orchideæ of Australia it is the tribes Vandæ and Neottieæ which most largely prevail (Ophrydeæ being restricted to two species), in this Region the Vandæ are few, and Neottieæ completely absent, while Ophrydeæ abound.

Sir J. Hooker conjectures the probability of a common origin of the Australian and South African Floras, derived from ancestors inhabiting a vast antarctic continent, of which the greater part has been submerged. In connection with this it is not a little remarkable that geologists tell us that the surface of the S.-W. Region consists of the older rocks which are known to exist in South Africa; the most recent being the Table Mountain Sandstone, which seems to be generally regarded as Devonian. But this hypothesis must be understood as referring exclusively to that portion of South Africa which is included in the Region I am now treating of. The affinities of this Region with that of other countries are more obscure, are certainly very slight, and have not hitherto been elucidated.

On the eastern boundary the Flora of this Region passes gradually into that of the Tropical African Region, and on the north, where, however the boundary is much sharper and more defined, into that of the Karroo Region.

The foreign vegetation naturalised in the Region demands a brief notice. I have made a list of about 158 species, of which the great majority are wide-spread European plants, with a few American and Indian species, which have been recorded as more or less naturalised throughout South Africa. The observations are imperfect as regards the eastern region, and the whole number would probably be nearer 200 species. Of these about 130 may be found within ten miles of Cape Town. Yet only the following can be said to occur in sufficient number in that locality to attract attention:—*Fumaria officinalis*, *Sisymbrium officinale*, *Brassica nigra*, *Raphanus Raphanistrum*, *Trifolium angustifolium*, *Serpicula repens*, *Sonchus oleraceus*, *Solanum Sodomæum*, *Datura Stramonium*, *Nicotiana glauca*, *Rumex acetosella*, *Panicum sanguinale*, *Briza maxima*, *Pteris aquilina*. A species of prickly pear, *Opuntia Tuna* (?),

which is very abundant and troublesome in the Karroo Region occurs also in the drier eastern portions of this Region. *Pinus pinea* (the stone pine), *Pinus pinaster*, and *Quercus pedunculata*, have been largely planted, but cannot be said to grow spontaneously although when once sown, the first named is one of the few introduced plants which can contend successfully against the indigenous undergrowth, in which the seed may be deposited without clearing and which it at length overtops and finally destroys. Few of the introduced plants are found far from roadsides or human habitations, and it is remarkable how small upon the whole is the influence they exert upon the aspect of the vegetation, and how weak (with the sole exception of the *Opuntia* referred to) is the aggressive power as against the indigenous Flora.

THE TROPICAL AFRICAN REGION.

This Region occupies almost the whole portion of the continent which lies between the tropics. Owing to the warm and moist climate caused by the currents of the Indian Ocean, the Flora attains a sub-tropical character to an extent very much greater than that of the west coast; and the Region puts forth an arm, which reaches about as far south as Port Elizabeth, and the Van Stadere mountains. From the Zitzikamma forest on the one side, to the ending of the Zuurberg range near Graham's Town on the other may be regarded as a debatable territory, where the present Region overlaps and intermingles with the South-Western Region. Generally speaking, its inland boundary appears to be the high range of mountains which, under various names, and not always quite continuously, run parallel with the coast—the Boschberg, Kagaberg, Winterberg, Stormbergen, Quathlamba mountains, Drakensbergen, &c. Thus it includes the Colonial districts Uitenhage and Somerset (in part), Albany, Bedford, Fort Beaufort, Peddie, Queen's Town, King William's Town, East London, and all the Transkeian territories, Natal, and Zululand, up to the tropic. The width of the Region ranges in this portion from 50 to 100 miles.

The physical features of the country may be easily understood if it be remembered that a lofty mountain chain, reaching from 5000 to 10,000 feet in height, slopes down gradually to the sea, sending down numerous rivers which cut up the intervening country by their deep valleys. The surface of the country is extremely varied; large tracts of bush alternating with open grassy downs, grass and bush sometimes intermingled in park-like stretches. In the western portion (the Addo and Fish River) there are dense thickets of bushes 10 to 15 feet high; further

eastward and northward these become forests, and in many parts the slopes of the mountains facing the sea are covered with woods to the summit.

The general aspect of the country is much greener and more luxuriant than that of the South-Western Region.

The climate of a Region stretching from the tropic to 34° S. is of course, in some respects, very different in different localities. At King William's Town, 1300 feet above the sea, the mean annual temperature is about 18·9° C. (66° Fahr.), the rainfall about 26 in.; further inland the rainfall diminishes; towards Natal the temperature gradually rises, and the rainfall is somewhat greater. At Pietermaritzburg, in Natal, at an elevation of 2096 feet above the sea, the mean annual temperature was 18·25° C. (64·83° Fahr.); the rainfall 30·23 inches; the humidity of the air 70·30 per cent. (9 years' observations, Dr. Mann). But the most striking difference between the climate of this and the South-Western Region is the fact that the one has chiefly summer, the latter chiefly winter rains.

The gradual transition from the South-Western to the Tropical Flora is noticeable in the bordering districts already named. The Cyadaceous *Encephalartos* (Kaffir bread) pushes one of its species along the ridges of the Zuurberg as far west as the pass known as Salt Pan's Neck. Leguminous plants begin to abound, especially the bush *Schotia speciosa* (Boer boon), a decidedly eastern type; and the same dry tracts are occupied by a succulent *Euphorbia* with four-angled thorny stems, *E. tetragona* (Noorsdoorn). In the woods near the coast, from the Knysna eastward, epiphytic orchids begin to occur (*Polystachya*, *Angræcum* and *Mystacidium*). Genera belonging to *Malvaceæ*, *Sterculiaceæ*, *Rubiaceæ*, *Asclepiadaceæ*, and *Acanthaceæ*, become more numerous, both in individuals and species. The only *Sterculia* hitherto known in the Colony, *S. Alexandri*, occurs in the Van Staden's Mountains, but has been found nowhere else. *Sansevieria thyrsiflora* covers the hill-sides over large tracts, and affords excellent fibre, at present the subject of experiments in rope manufacture. The beautiful *Calodendron Capense* (Wild Chestnut), a tree of the Order *Rutaceæ*, occurs throughout the Region; it has been met with on the Zambesi, and even on the Kilimanjaro Mountain, a few degrees south of the equator. The number of trees of handsome foliage and showy flowers might almost be said to characterise the Region. I can only mention a few of them occurring in the Colony, Kaffraria and Natal:—*Boscia Caffra*, *Oncoba Kraussiana*, *Dombeya* (3 species), *Spermannia Africana*, *S. palmata*, *Turraea obtusifolia*, *Aerido-carpus natalitius*, *Millettia caffra*, *M. Sutherlandi*, *Erythrina caffra*, *E. latissima*, *Sophora nitens*, *Calpurnia* spp., *Schotia speciosa*, *S.*

brachypetala, *S. latifolia*, *Gardenia* spp., *Pavetta* (many species), *Burchellia Capensis*, *Alberta magna*, *Tricalysia Capensis*, &c. The number of flowering shrubs is also very considerable amongst Malvaceæ, Sterculiaceæ, Rubiaceæ, Asclepiadæ, Scrophularinæ, Acanthaceæ, and many others. *Greyia Sutherlandi* is a curious Sapindaceous tree, with handsome crimson flowers, which extends from Kaffraria to Natal; it is allied to the endemic genera *Melianthus*, *Aitonia* and *Erythrophysa*, the two latter belonging, however, to the Karroo Flora. *Oldenburgia arbuscula*, a singular looking composite of dwarf arboreous habit and very large flower heads, occurs along the Zuurberg range, but must rather be regarded as an outlier from the South-Western Region, where it has two congeners, *O. Papionum* and *O. paradoxa*. *Vernonia*, which is almost entirely absent from the latter Region, begins to abound here, and increases in species as we proceed towards the tropic. The "everlastings" are well represented in many fine species of *Helichrysum*; and even the *Elytropappus rhinocerotis* (the Rhenoster bush) has pushed up as far as Graham's Town. The Euphorbiaceæ begin to occur in considerable numbers in Albany, and, as will be seen presently, occupy a very important position in this Region. Amongst the succulent species is the noble *E. grandidens*, which attains a height of 30 feet or more in favourable situations, and forms a very characteristic feature in the wooded ravines of the Region. The Coniferæ are not better represented than in the western districts—two *Podocarpi* (Yellow Woods), and the same *Widdringtonia cupressoides*, being all that occur. The Cycadaceæ have been mentioned already, but besides several species of *Encephalartos* there is the curious *Stangeria paradoxa* which comes down as far south as Lower Albany; and here it may be mentioned that the same genial climatic influences bring a Palm within our limits, *Phoenix reclinata* being found in the valley of the Kap River in the same district, this being probably its extreme boundary on the western side.

Amongst the Monocotyledons the Orchidæ have already been mentioned. The difference between the South-Western Region and the present one is here again evidenced. In the former the species of the tribe Ophrydæ largely predominate over the Vandæ; here, the proportions are reversed. In Natal, *Eulophia*, *Lissochilus*, and *Polystachya* are abundant in species, and take the place of the Disæ and Satyria of the west. *Calanthe natalensis* has lately been found as far south as the Perie Bush, near King William's Town. The *Strelitzia* are found as far north as Natal, and may occur beyond that country. Some of the finest Iridæ belong to this Region, especially the Gladioli, *G. psittacinus*, *G. papilio*, *G. Saundersii*, &c. Amongst Amaryllidæ may be

mentioned several fine species of *Crinum*, *Brunsvigia*, *Hæmanthus* and *Clivia*; of *Liliaceæ* the noble *Aloe Bainesii*, a tree of from 40 to 60 feet in height, and by far the largest and finest of the genus; also species of *Gloriosa*, *Sandersonia*, and *Littonia*. The *Cyperaceæ* and *Gramineæ*, as will be seen hereafter, yield a considerable number of species; *Prionium Palmita* occurs in Lower Albany; and amongst the latter *Panicum* and *Eragrostis* predominate. But beyond the statement that a large part of the intervening table land (if that may be so called which is really a country of sloping downs) between the mountains and the coast consists of grassy tracts, I have no information as to the predominance of particular genera or species in individuals.

Coming now to the composition of the systematic groups most prevalent in and characteristic of the Region, we possess three considerable collections. That made by Drège, some fifty years ago, included 2278 entries of flowering plants, and was collected over the whole area of the three Districts into which he divided the Region. Many of the entries are, however, of the same species, collected twice, or even thrice; so that it is only available for use as a whole, and even then upon the assumption that the number of species collected more than once, in each Order, bore an equal proportion to the whole. Secondly, a list of 1193 plants, collected in Albany district, mostly round Graham's Town, by my friend Professor MacOwan, and which he has kindly given me for this purpose. Lastly, a list of 1320 species collected by Mr. J. M. Wood in and near the Inanda, not far from Durban, Natal.

A few explanations are necessary respecting these collections. It is true that the broadest result would have been obtained by amalgamating them; but this would have required more time than is available to me. The collection of Drège, being made over the widest area, should be the most representative; but it is certain that the *Orchideæ* were neglected by him. In MacOwan's collection there are 46 distinct species of Orchids; in Drège's only 41 entries over the whole area, including duplicate entries of the same species. In Wood's collection the Orchids probably occupy too high a place; many in his list were not named; I counted them, necessarily, as distinct species, when doubtless some were repetitions of the same species. On the other hand, the *Cyperaceæ* and *Gramineæ* in his list, reaching to only 2.2 and 1.4 per cent. respectively, have clearly been collected much below the average. With these remarks, I think it will be better to give the three lists, side by side; and in some respects it will be more instructive, since a comparison of Wood's and MacOwan's well illustrates the known increase, as we proceed nearer to the

tropic, of the Orders Rubiaceæ, Euphorbiaceæ and Acanthaceæ, and the decrease of Ficoideæ and Geraniaceæ:—

DREGE'S LIST.		MACOWAN'S LIST.		WOOD'S LIST.	
<i>General.</i>		<i>Local.</i>		<i>Local.</i>	
	Per cent.		Per cent.		Per cent.
Compositæ ..	14·	Compositæ ..	17·5	Compositæ ..	13·1
Leguminosæ ..	9·9	Leguminosæ ..	7·6	Leguminosæ ..	8·4
Graminææ ..	7·7	Graminææ ..	6·9	Liliacææ ..	5·
Cyperacææ ..	4·5	Orobideææ ..	3·8	Orobideææ ..	4·2
Asclepiadææ ..	3·1	Scrophularinææ ..	3·1	Rubiaceææ ..	4·
Labiataæ ..	3·	Asclepiadææ ..	3·1	Euphorbiacææ ..	4·
Euphorbiacææ ..	2·8	Cyperacææ ..	3·	Asclepiadææ ..	3·9
Rubiaceææ ..	2·7	Grassulacææ ..	2·9	Acanthaceææ ..	3·1
Scrophularinææ ..	2·6	Geraniaceææ ..	2·4	Iridææ ..	2·8
Liliacææ ..	2·6	Euphorbiacææ ..	2·	Scrophularinææ ..	2·2
Acanthaceææ ..	2·4	Iridææ ..	2·	Cyperacææ ..	2·2
Malvacææ ..	2·2	Liliacææ ..	2·	Labiataæ ..	2·2
Iridææ ..	2·	Ficoideææ ..	2·	Celastrinææ ..	1·8
Orchideææ ..	1·8	Rubiaceææ ..	1·8	Graminææ ..	1·4
Anacardiaceææ ..	1·5	Umbelliferææ ..	1·8	Malvacææ ..	1·3

The difference between any one of these lists and that of the South-Western Region will be apparent at a glance: Ericaceæ, Proteaceæ, Restiaceæ, and Rutaceæ do not appear in the former at all; and Geraniaceæ in only one of them, viz., that one collected nearest to the South-Western Region; while the position of the other Orders common to both, excepting Compositæ and Leguminosæ, is widely different. Wood's list includes 2 Rutaceæ, 7 Ericæ, 2 Proteaceæ; Bruniaceæ and Restiaceæ are entirely absent from it. About Graham's Town, however, MacOwan found 6 Rutaceæ, 1 Bruniaceæ, 8 Ericæ, 6 Proteaceæ, 6 Restiaceæ. The two Regions appear to overlap widely; a few Ericaceæ have been found on the mountain tops nearly up to the tropic, and one or two Proteæ occur in the Transvaal; while outliers of a tropical type penetrate the South-Western Region as far as the Knysna forests, and even a little beyond.

I have not sufficient data of the Flora of tropical Africa, as a mass, to attempt to trace the affinities between it and the South-Western Region. So far as that portion of the former is concerned which stretches south of the actual tropic, and constitutes the subject of the present sketch, there is an agreement in the fact that Compositæ and Leguminosæ occupy respectively the first and second place amongst the Orders of each Region, as they do amongst the Orders of the whole World. This is important when we bear in mind the undoubted affinity which exists between the Flora of Tropical Africa and that of India, because in the latter country the Orders Leguminosæ and Rubiaceæ take the first and second place. The similarity, in other respects, will be shown if we

re the sequence of Orders in India with that of Wood's list :—

INDIA (*Hooker*)

Leguminosæ
Rubiaceæ
Orchidææ
Compositæ
Graminææ
Euphorbiacææ
Acanthaceææ
Cyperaceææ
Labiataæ

NATAL (*Wood*)

Compositæ
Leguminosæ
Liliaceæ
Orchidææ
Rubiaceæ
Euphorbiacææ
Asclepiadææ
Acanthaceææ
Iridææ

be remembered that, as I have said above, Wood's list is ly unduly deficient in Graminææ and Cyperaceæ, which probably be included in the above, and would throw out o lowest orders, it will be seen that there is a considerable ment between the two.

lists of Drège, MacOwan, and Wood, given above, contain ratively few naturalised foreign plants; yet we may not hat they exist only in such proportion; and exact informa-, in fact, wanting. My own personal acquaintance with egion is somewhat limited, extending only for about 150 of its south-western extremity. In the parts I have seen, ced plants, excepting *Opuntia Tuna* (?), in some of the drier a parts of the Uitenhage district, *Xanthium spinosum* occa-y, and *Nicotiana glauca*, are few in individuals, and exert very small influence upon the aspect of the Flora. They appear to differ much in character from those that have eferred to under the South-Western Region. In Wood's owever, there are certain tropical weeds which, as might be ed, do not occur in the older Colony.

THE KARROO REGION.

Region includes on the west side the coast strip of qualand lying between the mountains and the sea. How may extend north of the Orange River is unknown. South-it stretches between the Khamiesbergen and the sea, and passes over by tracts little known botanically, to the south est slopes of the Roggeveld mountains. Here it widens out cludes all that large tract known colonially as the Karroo; ed on the north by the Roggeveld, Nieuwveld and Sneeuw-mountains, on the east by the mountains fringing the Fish ; on the south by the Zwarteberg range, Kamanassiebergen, ally the Zuurbergen, and on the west by the mountains of arm and Cold Bokkeveld.

Speaking broadly, it is a vast, shallow basin, surrounded by mountains; but the mountains, while always loftier on the northern side, are sometimes a mere rim on the southern. Its height above the sea ranges from 1800 to 2500 feet. But for the purposes of floral computations I have reckoned all plants collected on the southern slopes of the northern mountains, up to a height of about 3750 feet, as belonging to this Region. Above that height, in certain localities, at least, the vegetation changes, and belongs to the next (the Composite) Region.

It is traversed by numerous river-beds or torrents, mostly dry or nearly so, except when filled by the summer thunderstorms, when the beds suddenly fill, carry off a vast quantity of muddy water for a few days, and soon again become dry. But water, generally, is scarce, and springs are infrequent.

The country has been subjected to long ages of denudation by rains and rivers, and exhibits its traces everywhere. It is probable that since the interference of man, which, by sheep pasturage has killed much vegetation and loosened and opened the soil, this denudation has proceeded more rapidly, and in some places enormous gullies have been formed where previously moist and fertile valleys existed. The surface consists chiefly of vast plains of light, reddish soil, which, when irrigated, is extremely fertile; in other parts it is more sandy, and in some places the soil is shaly, hard and barren. The plains are, however, broken by hills or mountains, sometimes with flat tabular tops. Everywhere the exposed rock is sandstone in beds, of varying colours and hardness, which have been regarded by Wyley and Dunn as belonging to the carboniferous measures. In the north-eastern portion these are traversed by frequent doleritic dykes, which are sometimes vertical, and sometimes lateral, forming cappings to the sandstone hills.

The climate is one of great dryness and extremes of heat and cold. The following observations have been recorded at Graaff-Reinet, a town on the northern edge of the region, 2476 feet above the sea:—Mean annual temperature 18° C. (64·41° Fahr.); mean of greatest range on any one day 3·26° C. (37·88° Fahr.); extreme limits of temperature (Dec. 20) 40·55° C. (105° Fahr.); June 24, 3·56° C. (28° Fahr.); rainfall 13·19 in., of which about two-thirds fell during the six summer months. The foregoing are from three years' observations. Twenty-three years' observations give an average of 14·5 in. of rain. Other observations of rainfall for other stations in the region for at least five years are:—Prince Albert, 7·71 in.; Beaufort West, 9·19 in.; Willowmore, 7·40 in.; Aberdeen, 12 in.; Jansenville, 9·44 in.; Springbok (Namaqualand), 8·05 in. The following are from one year's (1883)

observations only:—Port Nolloth, 2·66 in.; Touws River Station, 8·86 in.; Matjesfontein, 10·21 in. The greater part of the rains take place during the summer thunderstorms; occasionally, in the Eastern portions, a strong south-east wind brings up general rain, but this is rare, the clouds being usually discharged in the intervening mountain ranges which divide this Region from the two coast Regions, and intercept its rains.

During periods of drought nothing can be imagined more desolate and mournful than the appearance of the vegetation. The soil is rarely covered, bare patches of greater or less extent intervening between shrubs and bushes. These are frequently blackened by drought as if they had been killed by fire. The largest and indeed almost the only trees are those of the *Acacia horrida* (Doornboom), which line the banks of the dry river beds as with a fringe; and occasionally, on the higher mountain sides, a few other trees of shrubby habit occur. For the most part the shrubs are scattered, and range from 5 to 8 feet in height; with intervening shrublets of 1 to 2 feet. Yet after copious rains all will be changed within a week or two, as if by magic. Many of the apparently dead bushes put forth bright green leaves; the shrublets are covered with flowers often before leaves can be seen; bulbous plants, which may not have flowered for several years previously, send up their scapes with incredible rapidity, and annual flowering herbs and grasses are everywhere seen where formerly all was bare and barren. Namaqualand, perhaps, exhibits this phenomenon to the most striking extent. I was amazed on visiting that desert country after the rains of June to July, 1883, to see tracts, hundreds of acres in extent, covered with sheets of living fire, or glowing purple, visible from several miles distance, caused by the beautiful *Compositæ* in flower; and nothing is more singular than to see this luxuriance intermingled with the black or white branches of dead shrubs killed by previous droughts, standing like ghostly intruders on a scene of merriment and joy. These charming displays pass away all too rapidly, and in a month or two little that is beautiful remains.

I proceed to speak of a few of the chief plants of the Region most noteworthy, either from their beauty, singularity, or from their being confined to, or peculiarly characteristic of it. I am best acquainted with the Karroo of the Graaff-Reinet district, partly with that of Namaqualand, and for the rest have only passed through it as a rapid traveller. Several species of *Heliophila* are extremely bright in spring, especially in the west; and the monotypic *Palmstruckia Capensis*, which had only been gathered before by Thunberg, has just been re-discovered in Namaqualand. *Cadaba juncea* with its dark crimson flowers is a singular and

characteristic plant both of this and the next Region; while *Capparis oleoides* (the Witgat boom) standing generally alone, 10 to 15 feet high, with its white trunk which has given its vernacular name, is a prominent feature of many of the Karroo plains; the young buds are nearly or quite as good for culinary purposes as those of the Caper of Southern Europe. The Portulacaceæ occupy a prominent place chiefly by the well-known *Portulacaria afra* (the *spek boom*, or fat tree), a large shrub with fleshy acid leaves and panicles of small pink flowers. This occupies the hill-sides, often growing sub-socially in great masses and affording the most favourite food for live-stock of all kinds. It also occurs, though less abundantly, in the Tropical Region. In addition there are several species of Anacampseros, one of Talinum, and one of Portulaca besides the ubiquitous *P. oleracea*. *Tamarix usneoides* occurs in Namaqualand, where it is used as fuel, and is the only plant of the Order in our Region; it is recorded also by Drège as from the central and eastern Karroo. Amongst Malvaceæ are four species of Hibiscus, one of the most curious of which is *H. urens*, which looks at a short distance so much like a plant of the gourd family that every botanist is astonished to find upon it the flowers of a Hibiscus. Burchell says his Hottentots called it *Wilde Kalabas* (Wild Calabash). Of Sterculiaceæ, the genera Hermannia and Mahernia, are represented by 10 and 5 species respectively. The large Order Sapindaceæ includes *Pappea Capensis* (the Wild Plum), a shrub of 15 or 20 feet, frequent on mountain sides; *Aitonia Capensis*, also a shrub, the curious pendulous papery capsules of which look like miniature Chinese lanterns hung on a Christmas tree; the allied and even handsome *Erythrophys undulata*, of Namaqualand; and several species of Melianthus. The Geraniaceæ are a numerous Order. The curious candle-bush, *Sarcocaulon Patersoni* is here, besides numerous species of Pelargonium. The latter are especially frequent in individuals, and much diversified in structure, those with succulent stems and leaves constituting a marked feature of the Flora. These include *P. oblongatum*, a handsome species from Namaqualand, with yellow flowers, lately figured in the Botanical Magazine (t. 5996), *P. flavum*, *P. carnosum*, *P. crithmifolium*, *P. ferulaceum*, *P. pulchellum*, *P. sericeum*, *P. quinatum*, the very curious and rush-like, almost leafless, *P. tetragonum*, *P. peltatum*, *P. echinatum*, and many others. The Oxalideæ, though numerous and often brilliant, are less common than in the South Western Region. The Rutaceæ are conspicuous by their absence. I never found but one species in the Region, a Diosma, on the mountains of Namaqualand, evidently a straggler from their great home further south. The Zygophyllums are frequent and mostly with

succulent leaves; of the same family is *Augea Capensis*, a monotypic genus peculiar to the Central Karroo and abundant in many places, with thick terete leaves like those of a *Mesembrianthemum*. *Phylla*, so common in the South-Western districts, is here absent; one or two species hover on the boundary line of some of the mountains, but they are scarcely members of this Region. *Anacardiaceæ* are only represented by *Rhus*, of which there are about a dozen species. The *Leguminosæ* do not occupy nearly so prominent a place here as elsewhere. There are, however, several species of *Lotononis*, *Lebeckia*, *Indigofera*, *Rhynchosia*, the widely distributed *Sutherlandia frutescens*; and *Sylitra biflora*, found in this Region only. *Schotia speciosa*, an outlier of the Tropical Region, occurs sparingly. *Acacia horrida*, the only species of this genus within our limits, is scattered widely, but especially fringes the river beds; the timber is largely used for fuel, and the bark for tanning. The almost complete absence of *Aspalathus* is very remarkable. Of *Rosaceæ* there are but two species of *Grieli*um; while *Cliffortia* and *Rubus* are both absent. *Crassulaceæ* are an important constituent of the Region, *Crassula* and *Cotyledon* being numerous both in species and individuals. It is the Order *Ficoideæ*, however, that we may regard as the one most typical of the Region. *Mesembrianthemums* are met with everywhere, from the annual herb to the shrub with leaves of the most diverse and curious shapes, with flowers of white, yellow, and reds of many shades. In some portions vast tracts are covered with *M. spinosum* growing sub-socially almost to the exclusion of anything else. In Namaqualand is a huge species resembling *M. crystallinum*, but as large as a cabbage. Some of the larger flowered species are extremely brilliant. *Cussonia spicata* and *C. paniculata* are trees of the order *Araliaceæ* with congeners spread over the whole Colony. *Rubiaceæ* are here, as in the S.-W. Region, remarkably deficient, not more than half a dozen species occurring near Graaff-Reinet. Of *Compositæ* the larger genera are *Pteronia*, *Pentzia*, *Helichrysum*, *Senecio*, *Othonna*, *Euryops*. Those most abundant in individuals are *Aster filifolius*, *Chrysocoma tenuifolia*, *Adenachæna parvifolia*, *Pentzia virgata*, and *P. globosa*, *Eriocephalus glaber*, *Helichrysum* spp.; most of them are very aromatic, and, excepting the second, furnish excellent food for live stock. In Namaqualand a large species of *Didelta*, *D. spinosum*, is used as a substitute for spinach, and is eaten greedily by all animals. Several species of *Arctotis*, *Venidium*, *Gorteria*, &c., are exceedingly brilliant, and make a great display after rains. *Ericaceæ* are entirely absent. *Olea verrucosa* is one of the few trees of the Region occurring sparingly in mountain ravines, and furnishing the most useful wood for fencing poles and for fuel.

Of the order Ebenaceæ there are several species of *Royena* and *Euclea*. Some genera of *Asclepiadaceæ* seem to indicate an affinity with the Tropical Region and India. Such are *Gomphocarpus*, *Sarcostemma*, *Ceropegia*. Of the genus *Stapelia* there are many species, thinly scattered, besides *Huernia*, *Piранthus*, *Decabelone*, and the remarkable *Hoodia* of Namaqualand. *Adenium Nam-aquanum* (or Elephant's Trunk) is a curious *Apocynaceous* plant of the same country. *Gentianeæ* are almost, if not entirely, wanting. *Scrophularinæ* occupy a comparatively poor place,—*Diascia*, *Nemesia*, *Lyperia* being the chief genera, with some of the root parasites *Alectra*, *Striga*, and *Hyobanche sanguinea*. *Rhigozum trichotomum* is a handsome *Bignoniaceous* shrub. *Acanthaceæ* are very deficient and probably constitute less than one per cent. of the whole Flora. *Selaginæ* are also few; *Selago leptostachya* (*Aar-boschje*) is one of the good stock food plants. The ashes of *Salsola aphylla* (*Kanna-bosch*) are used for soap-making; and *Atriplex Halimus* and *A. Capensis* (*Vaal-boschje*) are considered most valuable food plants for sheep and goats. *Hydnora Africana* occurs in the eastern, and *H. triceps* in the western Karroo. *Santalaceæ* are represented, in *Osyris compressa*, the leaves of which here and in the two preceding Regions, are very generally in use for tanning; there are also several species of *Thesium*. *Euphorbiaceæ* are chiefly confined to succulent *Euphorbiæ*, in many forms,—melon shaped, 4-angled, many-angled, and club-shaped, in some tracts immensely abundant in individuals. During severe droughts *E. Caput-medusæ* (*Fingerpoll*) is in some places cut up as food for cattle; as is also a spinous species (*Euphorbia sp.*) after the spines have been previously burnt off. Several species of *Viscum*, and a few *Loranthi* occur; *Forskohlea candida* seems to be peculiar to the Region. There are one or two species of *Ficus*; and the widely distributed *Salix Capensis* occurs along many of the river banks. *Coniferæ* are entirely absent.

Orchidæ are scarce. In the whole eastern Karroo I found but one species, *Habenaria arenaria*; but in Namaqualand on the mountains, where the average rainfall does not exceed seven inches yearly, I saw a *Holothrix*, *Satyrium pustulatum*, *Pterygodium Volucris*, and *Disperis purpurata* var. Of *Hæmodoraceæ*, *Sansevieræ thyrsoiflora* is common on many hill-sides, but rarely flowers. It may here be mentioned that this is a common condition of many of the Karroo *Monocotyledons*. They pass years in a dormant state; not until rain and temperature coincide suitably to their need will they flower. Hence one may live seven years near a mountain side, and then first see it nearly covered with *Hesperantha falcata*; or one may watch the numerous bulbs of *Ammocharis falcata* in leaf for ten years, as I have done, and never see them

in flower. Iridæ and Amaryllidæ are neither by any means abundant in species or individuals. Liliacæ are much richer, and include Aloe (of which there are many fine species, *A. dichotoma* of Namaqualand being one of the largest) Haworthia, Apicra, Ornithogalum, Albuca, &c., in great variety and beauty; there are also many Asparagi. *Testudinaria elephantipes* is one of the best known and most curious plants of the Region. Juncacæ are scarce; Cyperacæ also but few, while Carex is entirely absent. Of Restiacæ, also, none have been found. Gramineæ are somewhat rich in species, and occupy the second place amongst the Orders of the Region; yet they occur chiefly in isolated tufts, and rarely except in some specially favoured spot can anything like turf be seen. They belong to many genera, amongst which may be named Panicum, Andropogon, Aristida, and Eragrostis.

Of Ferns there are perhaps eight or ten species in the whole Region. These are chiefly Cheilanthes, Pellaea, and Nothochlaena; most of them are peculiar to the Region, and five at least, according to Lady Barkly, are found in Namaqualand only.

The predominating feature of this Region is the peculiar adaptation of its vegetable life to meet the severe conditions of the dry and hot climate and soil. Succulence, which may here be taken to include thickened roots, stems or leaves, is displayed in the most diverse Orders. At Graaff-Reinet, on the north-eastern border of the Region, and where the climate is far less severe than further west, I counted 31 per cent. of all flowering plants as more or less succulent. In the central and western Karroo the proportion would be much larger. The prevalence of thorny plants is also very noticeable.

The following list of the chief Orders of the Region is taken from a list of 611 flowering plants collected by me mostly near Graaff-Reinet, all below 3750 feet above the sea, and being nearly a complete collection of the plants within twenty miles of that centre; to which are added 66 others collected by Drège, and by myself, in other parts of the Region, further south and west. But it does not include plants from Namaqualand, nor from the western Karroo generally. Substantially, it is a fair representation of the eastern Karroo; but I think it probable that a fuller and more general collection would reduce the position of Gramineæ, raise that of Ficoidæ and Geraniacæ, and introduce the order Iridæ into the first twelve.

CHIEF ORDERS—EASTERN KARROO.

	Per cent.
1. Compositæ	17·1
2. Gramineæ	9·2
3. Ficoidæ	6·8

						Per cent.
4.	Liliacæ	..	..	..	..	6·5
5.	Crassulacæ	..	..	..	..	5·3
6.	Leguminosæ	..	..	..	..	3·8
7.	Geraniacæ	..	..	..	..	2·9
8.	Scrophularinæ	..	..	..	..	2·9
9.	Asclepiadæ	..	..	..	..	2·5
10.	Sterculiacæ	..	..	..	..	2·5
11.	Solanacæ	..	..	..	..	2·2
12.	Cyperacæ	..	..	..	..	2·0

The Flora shows but weak affinities with either of the preceding Regions, and these are chiefly exhibited in widely butted genera common to the whole of Southern Africa. From South-western Region it differs in the complete absence of Rutacæ, Bruniacæ, Ericacæ, Proteacæ, Penacæ, and Anacardiaceæ, the six most characteristic orders of that Region; in the scarcity of Leguminosæ; and in the almost complete absence of the following large genera which are so abundant in the eastern Region: *Muraltia*, *Phyllica*, *Aspalathus*, *Cliffortia*, *Athanasia*, *Arctotis*, *Gnidia*, *Struthiola*. There is a marked approach in the abundance of Geraniacæ; and there is a marked scarcity of Rubiacæ and Acanthacæ. From the Tropical Region it is distinguished by abundance in Ficoideæ and Euphorbiacæ; and by its paucity of Leguminosæ, Rubiacæ, and Acanthacæ; to these might perhaps be added Malvaceæ and Euphorbiacæ, for these occur chiefly in the eastern Karroo, which borders on the Tropical Region. It may hereafter be found that the affinities of this Region, together with the succulent Region, are greater with the Kalahari Region than with any of the others; but at present our knowledge of the Kalahari is too imperfect to enable us to form a judgment.

With respect to the naturalized foreign plants of the Karroo, it may readily be supposed that the heat and drought of the climate would be unfavourable to European colonists. The number of such plants is indeed few, and chiefly confined to weeds of cultivation, which are here synonymous with irrigation; or to a few wayside plants. The number known to me does not exceed twenty-five. Those of American origin are more prominent. *Opuntia Tuna* (?) also mentioned, has a branched stem with obovate articulated leaves, covered with tufts of strong prickles; the flowers are yellow, and the fruit much eaten by the natives and colonists. Drège does not mention this plant, so that it must have been introduced since his visit (1826-1834). It is now a troublesome pest, growing in some places sub-socially, and breaking out the native vegetation. So tenacious of life is it that a piece of stem of a few square inches dropped upon the surface of the

dry soil, will take root and grow readily. Cattle and goats, driven to browse upon it by drought, suffer by the laceration of their mouths, and fall off in condition. Its eradication is slow and laborious, needing either to be completely buried, or burnt. The *Xanthium spinosum* is also a troublesome weed owing to its hooked achenes becoming entangled in the wool of sheep. *Nicotiana glauca* springs up immediately wherever quarries are opened; *Argemone Mexicana* has fairly established itself, though not yet abundant; and *Amsinckia angustifolia*, from Chili, has been found in Namaqualand.

THE UPPER REGION, OR REGION OF COMPOSITES.

This Region is bounded on the west by the Hantam and Roggeveld mountains; southward by the continuation of the Roggeveld range; the Nieuwveld, the Sneeuwberg range; thence across by the Boschberg and by the mountains about Daggaboer's Nek, towards the north-western flanks of the Great Winterberg mountain; eastward by the watershed which separates the waters of the Fish River from those of the Kei, so as to include the districts of Tarkastad and Albert, to the Orange River. Its northern boundary is in part unexplored. I am informed by Mr. E. J. Dunn, F.G.S., who has travelled through that part of the country for the purpose of exploring its geology, that the boundary-line on the north-west is well marked and coincident with the line of his Dwyka Conglomerate and the Karroo Beds, the former being covered by the Twa-grass (*Arthratherum brevifolium*) so characteristic of the Kalahari Region, while the latter bear the stunted bushes peculiar to this Region. This line would begin near the Kabiakouw mountain, thence it extends in a curve towards Hope Town, where it is certainly existent about thirty miles south of that town. It then runs northward, crossing the Orange River. The exact boundary in the Orange Free State is unknown to me, but it is probable that it takes a wide curve eastward between Bloemfontein and Smithfield, and again cuts the Orange River south-west of Aliwal North. It is thus an elevated country sloping gently from the southern edge towards the Orange River, at an average elevation of from 5000 to 4000 feet above the sea. I have included in the Region that part of the districts of Middelburg, Cradock and Tarkastad, which is formed by the basin of the Great Fish River above Daggaboers Nek. It is uncertain whether this is correct. Drège regarded this tract as belonging to the Karroo Region; but he passed rapidly through it (as I have also done) and scarcely collected anything. His view would have this consistency: that it would make the waters of the whole

Upper Region run into the Orange River; and those of the whole Karroo Region into the Southern Ocean. But the tract in question is somewhat more elevated than the rest of the Karroo, and appeared to me from its deficiency in succulents to belong rather to the present Region. The matter must be decided by further evidence, since no collections, so far as I know, have been made there.

The general aspect of the country is that of a vast treeless plain, interspersed at great distances by a few isolated and flat-topped mountains, or short ranges; or lower, and then very rugged rocky hills. On these hills or in the few ravines of the monotonous mountain sides, may be found a few stunted bushes. In fertile shallow valleys ("vleis"), grassy patches, with more luxuriant bushes 6 to 8 feet high, may be seen; but trees never, except such few as have been planted by the hand of man; or except the few (chiefly *Salix capensis*) which fringe the banks of the Orange River, where it flows through this Region; and the predominant and constantly prevailing aspect of the country is that of a heathy tract, or dry elevated moorland, covered with small shrublets of a dull green hue, the few intervening plants of different growth which occur being too small or too few to alter or modify the general appearance above described.

Respecting the climate of this Region no observations for any considerable length of time, excepting of the rainfall, have been made. The extremes of temperature are considerable, the summer maximum being nearly as high as in the Karroo Region, although the summer nights are always cool; while the winter temperature is much lower. Severe frosts are common, with occasional snows in winter and hailstorms in summer. The rains are almost entirely in the summer months, and usually accompanied by thunderstorms. The following list of stations at which the rainfall has been observed for a period of five years or more is taken from the Report of the Meteorological Commission for 1883. I take the stations in their order from west to east:—Fraserburg, 6·11 inches; Carnarvon, 7·78; Victoria West, 9·82; Richmond, 11·64; Hanover, 13·77; Middelburg, 14·17; Colesberg, 12·82; Cradock, 13·19; Tarkastad, 17·08.

The following remarks on the plants chiefly characteristic of this Region are based upon collections of 507 species of flowering plants made by myself chiefly on the loftier portions of the Graaff-Reine district (above 3750 feet above the sea) with a few in the districts of Murraysburg, Richmond, Hanover and Colesberg; of 331 (other) species collected by Drège in the same districts, together with Albert and Aliwal North; and of 135 (other) species collected by Mr. W. Tyson, chiefly in the district of Murraysburg; being a total

of 973 species. These lists and the calculations upon them, which will be found on page 119, were made some time ago. I have since doubted whether the higher mountain regions of the Sneeuwberg, and of Aliwal, should not rather be regarded as outlying tracts of the Tropical Region; the conditions of greater moisture favouring the extension of eastern types which do not occur in the immediately contiguous lower levels. The same conditions have permitted the lodgment of a very few south-western types. The result is to make the Region appear more rich in forms than it otherwise would be, to the extent of probably 15 per cent. of the species, and 6 per cent. of the genera; and in so far to increase the appearance of its affinities with the Tropical African Region. I regret that time does not allow the revision of the list, and that this statement must suffice.

The Geraniaceæ are fairly numerous, but do not here occupy, either as to singularity of form, or in respect of the number of individuals, the same prominent position they hold in the preceding Regions. One Rutaceæ, *Barosma venusta*, occurs on the Koudveld Mountain, at about 6000 feet; also two Phyllicæ on the mountains near Graaff-Reinet. The species of *Rhus* (*Taaibosch*) are numerous, 13 being recorded in our list. Leguminosæ are mostly small and inconspicuous shrublets of the genera *Lotononis*, *Argyrobium*, *Indigofera*, and *Lessertia*. *Lessertia annularis* is said to have poisonous effects upon cattle. The only handsome plant of the Order, which has here 19 genera and 52 species, is the widespread *Sutherlandia frutescens*. *Acacia horrida*, the only tree of the Order, and the only species of that genus occurring in the Region, hardly belongs strictly to it, being found only sparingly in sheltered valleys of the Sneeuwbergen, &c. A few species of *Cliffortia* are outliers of the South-western type growing only on the highest mountains. Crassulaceæ, similarly, though our list includes 33 species, are found very sparingly everywhere except upon the southern border of the Region; and are few in individuals. *Guthriea capensis* is a curious Passifloraceous plant with the habit of a Primrose, only found hitherto upon the highest parts of the Sneeuwbergen. Ficoideæ are very deficient in individuals, and the majority of those in our lists belong to the warmer parts about Murraysburg. Rubiaceæ have 11 species only, chiefly of *Anthospermum*, *Rubia*, and *Galium*. It is in Compositæ that we find the great strength of this Region, there being not less than 61 genera with 231 species. The largest genera are *Helichrysum* with 36 species; *Senecio* with 35 species; *Berkheya*, 11; *Euryops*, 10; *Pentzia* and *Gazania* each 8 species. The species most numerous in individuals are *Chrysocoma tenuifolia*, a small shrublet of little or no value for stock, covering vast tracks in the central part of the

Region, not indeed sociably, but intermingled with others, also, for the most part, Compositæ; *Helichrysum hamulosum*, *Eriocephalus glaber*, and other species; *Pentzia globosa*, *P. Burchellii*, *P. Cooperi*, all good stock plants; *Othonnopsis cluytiaefolia* and *O. pallens*; *Euryops* spp.; *Gamolepis trifurcata*; *Tripteris leptoloba*, *T. spinescens*; *Arctotis stoechadifolia*, &c. Five species of Ericaceæ are found on the highest mountains only, Ebenaceæ have five species of *Royena* and *Euclea*, usually stunted rigid bushes. *Olea verrucosa* (the Olive) is sparingly distributed, and grows very poorly. Of Asclepiadæ there are twelve genera and 27 species. Three species of *Lycium* are scattered, and one of them is a characteristic shrub of the bleak and dreary Roggeveld. Scrophularinæ are well represented in 20 genera and 38 species, of which the beautiful deep blue flowers of *Aptosimum depressum*, and the sky-blue *Peliosostomum origanoides*, alone deserve notice, and are worthy of cultivation. *Rhigozum trichotomum* is a Bignoniaceous shrub with handsome yellow flowers, belonging to this as well as to the Karroo Region. Acanthaceæ are deficient, having only 5 species; Selaginæ, 15; Labiatæ, 18; Thymelææ only 7, of which *Arthrosolen polycephalus*, a useless wiry shrub, grows almost sociably in some spots. *Salix Capensis* is only found in a few sheltered valleys in the lowest part of the Region, or on the banks of the Orange River.

Amongst the Monocotyledons Orchidæ have four species, all of the higher mountains. Irideæ are greatly diversified, having 12 genera and 20 species. Amaryllidæ are nearly as many, *Brunsvigia multiflora* being one of the handsomest, and there are several species of Hypoxis, mostly from the eastern mountains. Aroidæ are entirely absent. Liliaceæ are numerous; Aloes are very few; and there are several species of Kniphofia (4); Scilla (4); Ornithogalum (4); Bulbine (5); Asparagus (7); in all 20 genera with 47 species. Of Restiaceæ, 3 have been found on the highest mountains, outliers from the S.W. Region. Cyperaceæ have 22 species, including 2 Carices. Graminææ occupy a high position with 37 genera and 78 species. Though thus highly diversified they do not occupy a prominent place in the landscape of the country, everywhere occurring in isolated tufts, usually far apart from each other. Those most abundant in individual appear to be *Andropogon marginatus*, *Anthistiria ciliata*, *Aristida vestita*, &c., *Danthonia disticha*, *D. villosa* and others, *Eragrostis brizoides*, *E. striata*, *Melica dendroides* (*Dronkgras* of the Colonists from its apparently intoxicating effects upon cattle which feed upon it), *Festuca scabra*, &c., but I speak only of those parts of the country which I have actually visited.

The following list of the sequence of Orders according to their

number in species is prepared from the collections already mentioned :—

COMPOSITE REGION (EASTERN PORTION).

	Per cent.
1. Compositæ	23·6
2. Graminæ	8·0
3. Leguminosæ	5·3
4. Liliacæ	4·8
5. Scrophularinæ	3·9
6. Crassulacæ	3·3
7. Asclepiadæ	2·7
8. Geraniacæ	2·5
9. Ficoideæ	2·4
10. Cyperacæ	2·2
11. Iridæ	2·0
12. Amaryllidæ	1·9

It will at once be seen that the abundance of Compositæ is the most striking characteristic of the Region. Here also, the preponderance of individuals is immensely in excess of the numerical proportion of species.

As in the Karroo Region, Rutacæ, Ericacæ, Restiacæ, are practically absent; Bruniacæ, Penacæ, and Proteacæ, absolutely so. In comparison with the Karroo Flora, Crassulacæ and Ficoideæ occupy a much lower position; while in this case again the reduced proportion of species by no means represents the paucity of individuals. Notwithstanding this circumstance the relations with the Karroo Region are considerable in identical genera and species; in a similar deficiency of Rubiacæ, Acanthacæ, Verbenacæ and Aroideæ; and it may hereafter be found desirable to treat the two Regions as sub-divisions of one.

With respect to the Tropical African Region and the South-western Region the differences are more marked, as will be seen by a comparison of the predominating Orders of each.

The naturalised plants of foreign origin call for little remark. Those from Europe are confined to a few wayside weeds, or weeds of cultivation. *Xanthium spinosum* is a troublesome pest; *Argemone Mexicana* and *Datura Metel* have established themselves near the Orange River. The *Opuntia Tuna* (?), so annoying in the Karroo Region, is here little seen, only a few individuals straggling up the warmer valleys of the mountains on the southern edge of the Region.

THE KALAHARI REGION.

This Region extends but a slight distance into the Colony, and since our knowledge of its Flora, excepting the eastern part, is still comparatively small, I shall make but few remarks concerning it. Grisebach (*loc. cit.*) has carefully collected all that was

known up to 1872, and the reader is referred to his pages for more details than can be given here.

The northern boundary begins on the coast at about 18° S. lat., thence runs nearly due east, until it reaches about 30° of east longitude, when it turns south to the Orange River, crosses this near Hope Town, runs westwardly along the river and south of it conterminously with the boundary of our Composite Region, until it reaches the neighbourhood of the Kabiskouw Mountain; thence northerly along the east side of the Namaqualand mountains to the Orange River. Where it touches the coast again is unknown. It thus includes Great Namaqualand, Damaraland, Ovampoland, Bechuanaland, and great part, if not the whole, of the Transvaal, and the Free State.

The surface of the country is mostly very sandy, and generally speaking surface-water is everywhere very scarce, and springs infrequent. Nevertheless, when they do occur they are sometimes strong and copious, and there is every reason to believe that immense stores of underground water exist at no great depth over a large part of the Region.

The climate is not yet well known. The heat in summer is great, the nights cool, and even frosty in winter, and the rainfall which does not seem to be inconsiderable, is entirely one of summer thunderstorms. In the colonial Karroo the soil being baked, a large part of the rain runs off to the sea; here, on account of the sandy nature of the soil, the greater part is retained, and, in the case of heavy falls, goes to increase the underground stores. The coast strip from 16° S. down to the Orange River mouth, and bounded by the interior mountains, is even more dry and rainless than that of Little Namaqualand, and probably should be joined with the Karroo Region of the Colony.

The Kalahari is essentially a grass country interspersed with isolated shrubs or trees. Towards the northern boundary, which there corresponds with the southern limit of palms, these trees are grouped in dense forests. Further south the country is open. After the summer rains the grasses, which do not grow continuously like turf, but in tufts like stooling wheat, shoot up rapidly and acquire a height of three or four feet, sometimes even of five and six feet. East of the copper-mines of Namaqualand they have frequently been cut by the natives, and brought in loads for sale as fodder. Species of *Aristida* (Twa-gras) are the most abundant, but there are others coarser, and some of spinous growth.

The trees appear to be chiefly *Acaciæ* of several species, of which *A. giraffæ* (the *Kameel doorn*), is one of the most widely distributed; others are armed with formidable thorns. These occur

also, though sparingly, on the southern side of the Orange River; and from their existence, from the abundance of Twa grass, the presence of certain genera which do not occur further south, and the absence of the composite shrubs, we may infer that this tract known as Bushmanland, belongs to the Kalahari Region. The much controverted point as to whether the Orange River forms the floral boundary of the Colony, may now be regarded as decided in the negative.* The Olive of the Colony (*Olea verrucosa*) also occurs here, and a number of smaller shrubs, as *Capparis*, *Zizyphus*, *Grewia*, *Rhus*, *Tarchonanthus*, *Vangueria*, *Euclea*, *Royena*, *Lycium*, &c. The *Mesembrianthemums* of the Cape, and other succulent *Ficoideæ*, as also *Crassulaceæ*, appear to be very scarce, though not entirely absent. A species of *Atriplex* is regarded as valuable for stock in Bechuanaland. As very little is generally known respecting the plants found in this Region, I will give the following list of genera mentioned by Burchell, who travelled beyond Litakun, collected by Dr. Muskett near Hope Town, or found by myself near Kimberley and Barkly, in the south-eastern part of the Region: *Clematis*, *Cissampelos*, *Sisymbrium*, *Helio-philæ*, *Senebiera*, *Lepidium*, *Cleome*, *Cadaba*, *Capparis*, *Oligomeris*, *Polygala*, *Anacampseros*, *Talinum*, *Sida*, *Sphæralcea*, *Hibiscus*, *Melbania*, *Hermannia*, *Mahernia*, *Grewia*, *Corchorus*, *Triaspis*, *Celastrus*, *Zizyphus*, *Aitonia*, *Rhus*, *Crotalaria*, *Argyrolobium*, *Psoralea*, *Indigofera*, *Bolusia*, *Sesbania*, *Vigna*, *Cassia*, *Bauhinia*, *Elephantorrhiza*, *Vahlia*, *Cotyledon*, *Myriophyllum*, *Terminalia*, *Combretum*, *Mesembrianthemum*, *Tetragonia*, *Aizoon*, *Phar-naceum*, *Vangueria*, *Vernonia*, *Pteronia*, *Nidorella*, *Nolletia*, *Chrysocoma*, *Tarchonanthus*, *Helichrysum*, *Geigeria*, *Pentzia*, *Senecio*, *Othonnopsis*, *Osteospermum*, *Wahlenbergia*, *Lobelia*, *Royena*, *Euclea*, *Menodora*, *Olea*, *Raphionacme*, *Pachypodium*, *Gomphocarpus*, *Dæmia*, *Barrowia*, *Ceropegia*, *Sebæa*, *Chironia*, *Trichodesma*, *Heliotropium*, *Lithospermum*, *Ipomæa*, *Convolvulus*, *Evolvulus*, *Falkia*, *Solanum*, *Lycium*, *Aptosimum*, *Peliostomum*, *Nemesia*, *Rhigozum*, *Pterodiscus*, *Harpagophytum*, *Sesamum*, *Barleria*, *Justicia*, *Bouchea*, *Ocimum*, *Salvia*, *Stachys*, *Leucas*, *Boerhaavia*, *Celosia*, *Hermstaedtia*, *Sericocoma*, *Atriplex*, *Salsola*, *Oxygonum*, *Arthrosolen*, *Loranthus*, *Euphorbia*, *Croton*, *Ficus*, *Salix*, *Lanaria*, *Cyanella*, *Babiana*, *Gladiolus*, *Crinum*, *Brunsvigia*, *Buphane*, *Asparagus*, *Aloe*, *Bulbine*, *Eriospermum*, *Anthericum*, *Tulbaghia*, *Dipcadi*, *Ornithogalum*, *Cyperus*, *Andropogon*, *Anthis-tiria*, *Aristida*.

* On this point I am indebted for valuable information to Mr. E. J. Dunn, and also to Dr. E. B. Muskett of Hope Town, who first pointed out to me that the statements on this subject of Burchell, usually so accurate, were mistaken.

On the west coast near Walwich Bay is the very remarkable *Welwitschia mirabilis* (Tumboa) of the Order Gnetaceæ; and the singular Cucurbit, *Acanthosicyos horrida*, the fruit of which is used by the natives.

Towards the eastern edge of the Region, including part of the Transvaal and the Free State, the Flora passes gradually over to that of the Tropical African Region, and is especially rich in tropical types in the neighbourhood of the well-known Magaliesbergen. The collections in the Transvaal have been considerable, but I do not treat of them here chiefly because of their intermediate character.

European Plants in the Cape Colony.

The following remarks on the European plants found in the Cape Colony apply to all those parts of the several Regions I have visited; but not to Kaffraria and Natal, which I do not know, except from the reports of others. I have already referred to the fact that such plants are seldom found at any considerable distance from human habitations, or from waysides. One may walk for a whole day over mountain-sides, or even plains and scarcely see a European plant. On Table Mountain, which, as every one knows, is close to Cape Town, the resort of Europeans for 200 years past, if the observer leaves the low valleys, where up to 500 feet the common species I have named above on page 101 may be found* together with such plants as *Verbena officinalis*, *Verbascum virgatum*, *Phytolacca decandra*, *Sanicula Europaea*, *Hypochaeris glabra*, *Anagallis arvensis*, &c., he will find little or nothing beyond. In fact I can remember no plant at an elevation of 1000 feet except *Bartsia Trizago*, and even that is by no means frequent. It is almost the same on the plains when one has left houses and roads a few miles away. By some watercourse or stream, *Epilobium hirsutum*, *Lythrum hyssopifolium*, *Cotula coronopifolia*, or some other water-loving plants may be met with, but little else. Nor is the case different in other parts of the Colony and on the higher mountains. On the highest parts of Compassberg (8500 feet?) and on the Winterhoekberg (6500 feet) I did not find a single European species, or indeed any foreign species. It is true the situation was there unfavourable for many plants, being steep, rocky, and sometimes dry. Yet the first named has summer thunderstorms and winter snows, and the latter regular winter rain and snow, and it might have been expected that some hardy alpine species could here have found a lodgment. On

* I have there omitted *Erigeron Canadense*, a common wayside weed.

the lower mountains of the Eastern Region may be found *Thalictrum minus*, *Agrimonia Eupatoria*, *Bartsia Trizago*; I can recollect no others. On the Sneeuwberg mountains the first-named and *Blitum virgatum*.

These facts seem to show that the arrival of the majority of the introduced foreign plants in South Africa is of comparatively recent date; of the great bulk of them probably contemporaneous with that of civilized man.

The subject of European genera found within the Colony is a much wider one; but I am unable to enter upon it here.

Summary.

Speaking generally, and disregarding exceptions, the Flora of the Regions of South Africa is distinguished:—

1. By its highly differentiated character.
 2. By its want of luxuriance of growth (but from this the Tropical Region must be excepted).
 3. By the narrow distribution area of each species.
 4. By the deficiency of trees.
 5. By the paucity of sociable plants.
 6. By its power to resist the aggression of foreign invaders.
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CHAPTER V.

SOUTH AFRICAN WOODS AND FORESTS.

BY D. E. HUTCHINS, F. R. MET. SOC.,

Conservator of Forests.

THE woods and forests of South Africa fall naturally into three classes:—First, the woods of naturalized species in the Cape Peninsula and elsewhere; second, the indigenous high timber forests, clothing at intervals the mountain ranges of the seaboard; and third, the indigenous coast scrubs.

The indigenous forest that once clothed the slopes of the Table Mountain range has disappeared, with the exception of a few trees in the deepest gorges, where fire and axe could not reach them. But to a great extent these ancient woods have been replaced by others, in many respects more beautiful, and at the same time more rapid-growing and useful. The Cluster Pine (*Pinus Pinaster*), the Stone Pine (*P. pinea*), the Oak (*Quercus pedunculata*), the White Poplar (*Populus alba*), are thoroughly naturalized in the Cape Peninsula. They are hardier, grow more rapidly, and reproduce themselves more easily than the indigenous woods that they have replaced. The oak and poplar preserve their European habits, and are leafless during the winter for three or four months. Their bursting into leaf with more than the glory of an English spring furnishes a sight that the forester looks for in vain in the ever-green, ever-sombre native forests of South Africa.

The Oak grows freely throughout South Africa, but reaches its best development only in the west, where the winter rains produce a climate similar to that of Southern Europe. Compared to the English oak, the tree at the Cape has a foliage about twice as dense, and an acorn almost twice as large. It grows more than twice as fast, and there is nothing to show that the wood, under skilful treatment, would not be as good as the oak of Europe. The oak is the glory of the Cape Peninsula, growing with a vigour and beauty that surpasses the same tree in Europe, and, it is said, in New Zealand and Australia. The oak at the Cape coppices freely, but is usually pollarded where small wood is wanted. It is also the practice to plant it as a pollard, instead of as a sapling. This treatment very naturally produces



THE YELLOWWOOD TREE.

[To face page 124.]

such unsound wood. The oak has been naturalized at the Cape for over 200 years.

The Cluster Pine has been naturalized for a shorter time than the oak, but, if possible, it is more at home. It is gradually spreading itself naturally along the bleak terraces of Table Mountain and over the barren sandy flats of the Cape Peninsula. It grows very rapidly, sometimes as much as two inches in diameter per annum, and produces a coarse wood useful for beams and for all outdoor work when impregnated, but otherwise liable to rapid decay. It is free from the disease that attacks the Stone Pine, and, on account of its hardy and rapid growth, and its easy natural reproduction, is the chief feature in silviculture in the eastern climate of South Africa. It is the same species as the Maritime Pine of the French, the tree that has transformed the barren sands of Gascony.

The Stone Pine resembles the Cluster Pine, except that it is not so fast growing, and is liable to a fungoid disease; otherwise, it is as completely naturalized as the Cluster Pine. Indeed, the two pines grow side by side in the woods of the Cape Peninsula, and to a stranger look exactly alike. The wood of the Cluster Pine is slightly more durable. Neither should be employed out of doors unless injected. When injected, both are useful for railway sleepers, and a variety of uses. At present they are chiefly used for firewood.

The Blue Gum (*Eucalyptus globulus*), introduced in 1828, is now found as a planted tree throughout South Africa. There are extensive plantations of Blue Gum trees, formed by the Government, in Cape Colony, and by private owners in Natal. In these the tree reproduces itself freely from coppice shoots—very sparingly from seed. These plantations yield at the rate of ten tons (dry weight) of wood per acre per year when in good growth. The wood is used for firewood, pit-props, and occasionally, where a piece of tough wood is wanted, for wagon work. But Blue Gum wood is difficult to work when dry, and very liable to split while drying.

The Poplar requires a cool climate, a moist situation, and a good soil. Its wood is used for the same purposes as the imported poplar, viz., in match making, cheap furniture, and other light work.

In the various Government plantations in Cape Colony, nearly all the useful trees of the warm temperate zone are grown. It is difficult as yet to say which kinds will ultimately prove the most valuable introductions. In the two oldest established of the Government plantations, at Tokai and Ceres Road, the most promising are:—

One of the Red Gums (<i>Eucalyptus rostrata</i>) . . .	} Durable timber.
The Jarrah (<i>E. marginata</i>) . . .	
Kari (<i>E. diversicolor</i>) . . .	Fast-growing in sand.
Plane (<i>Platanus occidentalis</i>) . . .	Furnishing shade; grows freely from cuttings.
Pencil Cedar (<i>Juniperus Virginiana</i>) . . .	} Wood fragrant, durable, and valuable for export.
Pencil Cedar (<i>J. Bermudiana</i>) . . .	
Insignis Pine (<i>Pinus insignis</i>) . . .	Fast growing and good wood, but does not stand drought.
Canary Island Pine (<i>P. Canariensis</i>) . . .	Fair wood, transplants easily.
Jerusalem Pine (<i>P. Halepensis</i>) . . .	Stands drought well. Plant not farther than one yard apart.
Camphor Tree (<i>Laurus camphora</i>). . .	Requires mild climate and careful planting. Wood valuable.
The American Black Walnut (<i>Yuglans nigra</i>). . .	Wood useful for furniture and a variety of purposes.

There is no elastic wood in South Africa, and the American ash (*Fraxinus Americana*) and other woods are being grown in the plantations to supply this want. Since the nurseries and plantations at Tokai were begun in 1884, over half a million trees have been sold to the public at a cheap rate to encourage tree-planting. The average price per tree paid by the public has been a little over three farthings. About two square miles have been planted at an average cost of £8 4s. 6d. per acre. Altogether 2,000,000 trees have been planted or sold from this one plantation, at a mean cost of 2½d. per tree. The Blue-gum timber from the Worcester plantation, formed in 1876, is now being sold at a handsome profit to the Kimberley mines. The re-growth here is better than the trees originally planted. Convict labour has been largely utilised in producing these successful results.

Both at the Cape and Natal the Australian wattle barks are successfully grown. *Acacia decurrens* (var. *mollis*), and *A. pycnantha* yield the largest percentage of tan, but the growth of neither of these species is at the Cape equal to that of *A. saligna*, the common wattle of West Australia, now largely grown on the Cape flats, or to the hardy Port Jackson wattles, *Acacia glauco-phylla*, and *A. cycloptia*, that grow freely everywhere in South Africa. Within the last few years these hardy species have transformed considerable areas of sandy wastes on the Cape Peninsula. The dangerous sand drifts on the Cape flats, in the neighbourhood of the main line of railway, have been planted and fixed by the Forest Department. The Australian

are always successful in these plantations. The Cluster trees in many of them. The system, which is pursued with success, is to fertilise the sand with town refuse brought in by rain. An extensive sand drift at Eerste River has been washed away during the past year. In Natal, the valuable variety of *Acacia decurrens* is grown with great success.

TIMBER FOREST.

There is historic evidence that most, if not all, the ranges of mountains facing the sea-board, as well as the higher mountains inland, were at one time clothed with the timber forests of which we have now remains at Knysna, in the east of the colony north of King Williamstown. This is of the evergreen laurel-like character that exists in these forests in various parts of the world. It is strikingly like the forests that constitute the chief glory of the lovely Nilgiri Mountains in Southern India. In the South Africa of to-day, the forest begins in the Knysna forests, reappears on the Drakensberg Mountains, and thence extends through the Transkei to the Zululand. In fact, these timber forests form a well-defined zone characterised by a cool damp climate, the altitude increasing as the latitude decreases. At Knysna, the timber forest rises from sea level to a little over 2000 feet; along the coast from 2000 to 4000 feet; along the Drakensberg, from 4000 feet. The mean temperature of this region varies, in Cape Colony, from 61° (the South of France) to 50° or 52° (about that of the South of England). Frost and snow occur, but the latter does not lie long on the ground, owing to the action of hot winds from the interior. Rain, which is distributed throughout the year at Knysna, becomes scanty in winter as we proceed eastward, till the rainless winters of the northern Drakensberg are reached.

The extent of the timber forests are in progress. The latest statement under this head gives the following areas:—

	sq. miles.
Cape Colony (including Transkei)	550
Natal	259*
Zululand, say	75
Total	<u>884</u>

The whole of this 550 square miles of forest in Cape Colony is under the management of the Forest Department. More than 200,000 acres of the Natal timber forests have been alienated, and

* Report of the Forest Commission of 1880.

are being rapidly destroyed. This inevitable destruction of private forest is not peculiar to South Africa.

Of the wooded areas in the Transvaal, Bechuanaland, and Mashonaland, very little is known. So far as we have any authentic information they are, as timber, of secondary importance the trees being usually of stunted growth and excessively hard.

THE KNYSNA FORESTS.

These occupy a narrow strip of country lying between the Outeniqua Mountains and the sea. The forest region is about 110 miles long and ten miles broad, extending from George to Wit Els in the Humansdorp Division. The topography of the region is a plateau 600 feet above sea level, intersected by numerous short rivers running from the Outeniqua Mountains to the sea. The forests line the steep valleys of the rivers, occur in patches on the plateau, and are nearly continuous along the flanks of the mountains. Lying between the mountains and the sea, this remarkable strip of country is everywhere characterized by a sufficient rainfall varying from a yearly average of 20 inches to 40 inches, distributed in a manner that is rare in S. Africa, is evenly throughout the year. As a consequence the forest vegetation assumes a luxuriant semi-tropical character. Within the forest, the soil (whatever be the subjacent formation) is invariably extremely fertile. Outside the forest the open country consists of barren moor land—the Zuurveldt—which, on being analysed, is found to be characterized by an almost complete absence of plant food. Unless heavily manured it will support only a useless vegetation of heather and rushes. The poverty of this moorland soil is independent of the geological formation (which varies); and contrasted with the rich forest soil, is very remarkable. It is due to the climatic conditions of the country, viz.:

1. The continuous rain washing out plant food as fast as the decomposition of mineral matter produces it.
2. The absence of frost sufficient to have any effect in decomposing the rocks.
3. The veldt fires which periodically send seawards such plant food as the surface vegetation has formed.

Within the forest different conditions prevail. There, Nature's vast vegetable sponge retains plant food matter as fast as it is formed, and the soil is one of ever-increasing richness. These conditions prevail everywhere more or less within the forest regions of South Africa, and have been one great cause of forest destruction, the savage races ever seeking to occupy and destroy fresh, rich, forest land.

It is thus a matter of the utmost importance to preserve and

augment as far as may be the forest area. The destruction of the forest means the swift degradation of a soil of surprising fertility to one of phenomenal poverty. The first downward step in this degradation is a forest fire, and this brings us to one of the chief functions of the Forest Department, *the replanting of burnt forest*. At Knysna, a large central nursery is maintained, and when, in spite of the precautions taken, a forest fire does occur, the rich soil teeming with the stored-up plant food of ages, is immediately planted and thus re-occupied by trees.

For this purpose, at Knysna, a stock of strongly-grown young trees are kept always on hand in the nurseries. The two chief difficulties to contend with there are, the hot dry "berg" winds and the luxuriant growth of weeds, difficulties that can be met in no better way than by putting in large strong transplants of the leaf shedding class of trees. No delay must take place in planting burnt forest. In a few months, if left to itself, the soil will be covered with a luxuriant growth of ferns and weeds followed by an impenetrable thicket of bramble, *Helichrysum*, *Metasia*, Cape Gooseberry, *Psoraleas*, *Rhus*, and *Pelargoniums*, in which state planting becomes difficult and expensive. In 1891, for every tree cut in the Government Forests at Knysna, twelve young trees were planted.

The general system on which the forests of the Colony are managed approximates closely to what is known in German forestry as "*Femelschlagbetrieb*," or selection-felling in groups, which is briefly this. The forests, having been surveyed, are divided into a working unit called the "Series." Each Series is subdivided into forty Sections, one of which is cut over yearly. In the Knysna Conservancy there are thirteen of such Series. The size of the Sections varies within certain limits, according to the grouping of the forests. The average at Knysna is 100 acres. The trees which are cut yearly in each Section are those which, from old age, irregular growth, or disease, are better cut now than left in the forest. The marking and measuring of the trees in a forest Section demands great care and considerable experience. Every tree in the Section has to be examined and classed either for felling or for reservation.

To a great extent the present system is an inversion of that which prevailed previous to 1883, and which was rapidly ruining the forests. Formerly the woodcutter selected the trees to be felled, choosing those which best served his purpose. Now, the selection is made by the Forest Department, in the interests of the forests. The improvement and regularization of the forests are the first objects sought, while at the same time the closest attention is given to the utilization of colonial woods on which

the forest revenue depends. The revenue from the Knysna forests has doubled within the last five years and is now sufficient to pay all the ordinary expenses of management. These results in a young estate where there is much planting, road making, building of cottages for foresters, etc., are very satisfactory. The forests of Algeria do not as yet pay half their working expenses.

The more successful management of the Knysna forests has been achieved mainly through the aid of the sleeper industry there. This was established in 1884. The Government maintains its own creosoting factory at Knysna, so that the soundness and durability of the Knysna sleepers are guaranteed. Up to the close of 1891 the factory had turned out a total of over half a million sleepers. The inclusive average cost of the Knysna sleeper, delivered on the railway at Cape Town has been at the rate of 5s. 5d. per sleeper, or deducting the timber dues paid to Government, about 4s. 9d. The cost of the imported pine sleeper, which is softer and less durable than the Yellowwood sleeper, has averaged 5s. 6d. The further importation of pine sleepers has now been abandoned; likewise the use of the iron pot sleepers. Experience only can show whether the costly sheet-iron trough sleeper, which is now in favour, will in the end prove as good as the Yellowwood sleeper.

THE AMATOLA FORESTS.

These occupy the southern slopes of the Amatola Mountains and subsidiary ranges north of King Williamstown. They lie at a mean elevation of 2000 feet above the Knysna forests, in a more bracing and pleasant climate. Though very similar to the Knysna forests, there is a distinct change of trees with the change of climate to dry winters. The Stinkwood, Essenwood, Quar, and Wit Els of Knysna disappear, and are replaced in the Amatolas by Sneezeewood, Kafir Plum, White Ironwood, Kafir boom, and Wild Lemon. The veldt, or open country, is grass, and furnishes good grazing for stock, thus making it easier to work the Amatola than the Knysna forests. The stature and growth of the trees on the Amatolas is quite equal to those at Knysna. The Amatola forests are less compact than those at Knysna, but more heavily timbered. The forests are managed on the same system as those at Knysna. The railway passes through the eastern end of the Amatolas, and there the forest had been greatly destroyed—precisely the place where it was most valuable. To remedy this, within the last few years, a large area near Greytown has been successfully re-forested with plantations of introduced trees. A small plantation exists at Cathcart, further up the line of railway; and it is intended to form a plantation further north still, at Queenstown. The eastern type of forest first met

with on the Amatolas extends, with but little change, through the Transkei and Natal to the highlands of Zululand. An excellent description of the forests of Natal has been furnished lately by a Cape forest officer.* The forest scenery of South Africa is one of great natural beauty. From time to time the sober laurel-like tints of the evergreen foliage are lit up by masses of gorgeous flowers, such as the chestnut in the eastern forests and the more richly beautiful and scented vleir at Knysna. Tree-ferns abound, and gigantic creepers trail to the ground from the topmost branches of lofty trees. Streams of water are met with everywhere, clear and Alpine on the Amatolas, peaty and brown at Knysna. To the painter the ever-changing scene offers rich contrasts of sunshine and cloud—effects that are not met with under the usual hungry, empty sky of the clear atmosphere of the Cape. Added to this, at Knysna, there is the blue of the illimitable Southern Ocean and the white of the restless surf breaking on an iron-bound coast at the foot of lofty cliffs.

WOODS OF THE TIMBER FORESTS.

There are two species of Yellowwood—the Outeniqua Yellowwood (*Podocarpus elongata*, L'Hérit), a tree of gigantic proportions, and the Upright Yellowwood (*Podocarpus latifolia*, L'Hérit), averaging about one-half the size of the Outeniqua. The wood of the latter is slightly harder and heavier than the former, but in both the timber has practically the same properties—close, even-grained, easily worked, and, though about the same weight as Baltic pine, a good deal harder. Yellowwood, in fact, is one of the best woods in existence for flooring; it wears like Teak, and is free from the knots and splinters of pine flooring. Yellowwood furnishes excellent beams, and, when creosoted, first-class sleepers. Yellowwood sleepers have been regularly used on the Cape railways for the last eight years. Furniture made of Yellowwood is steadily advancing in favour—the dark heart found in a few old trees is specially ornamental. About eight-tenths of all the large timber in Colonial forests is Yellowwood, and in the best forests about one-half of all the trees are Yellowwood. Some of the old Yellowwood trees in the Knysna and Amatola forests are magnificent specimens. The Outeniqua Yellowwood, known as the “Eastern Monarch,” measures twenty-three feet in girth by eighty feet in height. It is quite sound, and not a very old tree. There are few finer sights in South Africa than some of these grand old Yellowwood trees, their

* Report on the Forests of Natal. By H. G. Fourcade. Maritzburg: 1890.

massive limbs flung out like those of an old oak, but with a length of bole surpassing that of the finest oaks in Europe.

STINKWOOD OR LAURELWOOD.

Ocotea bullata (E. Mey) has been happily called the Oak of South African forests. In weight, hardness and appearance (in the dark kind) it is not unlike old oak. The light kind varies in colour from a whitish to a golden yellow. In some specimens the grain has a wavy mottled appearance with a lustre like that of polished Crocidolite. Such a wood is naturally one of the most beautiful for cabinet-work. The choicest furniture now made in Cape Town is of Stinkwood. But the wood is difficult to season, and more so to work, so that the ordinary prices quoted for Stinkwood furniture are 25 per cent. above those for furniture made of oak, walnut, or mahogany. The greater portion of the Stinkwood used in the Colony goes into the felloes of cart and wagon wheels. For this purpose its tough interlacing fibres make it admirably adapted. There is no elastic wood like ash or hickory in the forests of South Africa, but Stinkwood is the nearest approach to them. Stinkwood sells readily in the forest at 1s. per cubic foot, as it stands. Being unsurpassed as a cabinet wood, it would be exported if it were more abundant. At present it forms about 9 per cent. of the timber in the Knysna forests. The cultural operations of the Forest Department tend steadily to increase this proportion. In the eastern forests of the Colony Stinkwood exists only as a botanical curiosity. In the Transkei and in Natal it is again found. The different varieties of Stinkwood are produced by the same tree. The dark variety is not heart-wood, but usually comes from old trees. Stinkwood has several remarkable peculiarities of growth. The seed is almost always bad; and the supply of seedlings produced naturally very small. The trunk of the tree is short-lived and much subject to decay; but the root and stool are almost imperishable, and constantly re-shoot whether the trunk has been cut by man or fallen into decay of its own accord. Thus, the more Stinkwood be cut the faster it grows (provided it be not dominated), so that with proper care it is not difficult to increase the proportion of this valuable tree in the forests. Being mostly produced from coppice shoots, Stinkwood shows a better rate of growth than the other valuable timbers of South Africa, which are all very slow growing. Stinkwood derives its name from the offensive smell emitted by the newly-cut wood. This smell soon disappears. The laurel-like leaf, from which its other name is derived, is spicy and aromatic, tasting like cinnamon when chewed.

SNEEZEWOOD (*Pteroxylon utile*, E. and Z.).

Sneezeewood rankswith Jarrah and Greenheart as an imperishable wood. Put into the ground, it resists decay like a piece of stone. Put into marine works, it has only once, and that under exceptional circumstances, allowed any entrance to the dreaded *Teredo navalis*. Sneezeewood is unknown in the Knysna forest; but in the eastern forests it is the most valuable species. From



SNEEZEWOOD IN THE PERIE FOREST.

the Amatola forests it extends upwards along the eastern coast of South Africa, always prized whenever a hard imperishable wood is wanted. The splitheart of Sneezeewood furnishes the best fencing post known. Sneezeewood sleepers are indestructible and imperishable. A large proportion of the heavy outlay on railway sleepers might have been saved, and the remainder kept in the country, had the Sneezeewood in the forests been conserved sooner.

It was still sold on the King Williamstown market as firewood when the writer took over the management of the Eastern Conservancy in 1883. For half a century it was the favourite firewood in the east of the Colony: and the burning of it was like the burning of bank notes! It is now very strictly conserved and propagated artificially to some extent. The wood is imbued with a pungent essential oil, to which it owes its durable qualities. On sawing it, if the sawdust reaches the nostrils, violent fits of sneezing are produced. The leaf of Sneezewood has a bitter taste like quinine. Sneezewood is usually a small or middling-sized tree, neither very sound nor well grown, but in the Amatola mountains specimens are occasionally met with up to 6 feet in diameter and 35 feet of bole.

WAGON WOODS.

Assegai (*Curtisia faginea*, Ait.) and White Pear (*Apodytes dimidiata*, E. Mey), deserve special mention on account of their



SILVER TREE ON THE SIDE OF TABLE MOUNTAIN.

value as wagon woods; the first for spokes, the second for felloes. Both have been much cut out, and would speedily become extinct but for conservation and the cultural operations undertaken in their favour by the Forest Department.

Black Ironwood (*Olea laurifolia*, Lam.) is at present the *bête noir* of systematic forestry in South Africa. It forms about 20 per cent. of the forest at Knysna. There is but a small local demand for it, and a still smaller exportation, so that the wood is accumulating on our hands in yearly increasing proportions. Like many tropical trees, it is too hard and heavy to be profitably worked, and not being durable, it is of no use for outdoor purposes. Being a species of olive it has, when polished, the handsome streaked appearance of olive-wood, and will doubtless some day be profitably exported to Europe. A few tons went lately to Hamburg. Ironwood is a large lofty tree, with a clear bole, sometimes reaching sixty feet in height.

The Clanwilliam Cedar (*Callitris arborea*, Schrader), a middling-sized tree with a whitish wood, coarser but even more fragrant than Pencil Cedar, is peculiar to the lofty Cedarbergen mountains on the west coast. It is only found above the winter snow-line. It is becoming gradually exterminated by fires and cutting; but conservation, on account of the difficulties of the locality, would be so costly that it has not yet been attempted.

The curious Silver Tree (*Leucadendron argenteum*, R. Br.), is peculiar to the slopes of the Table Mountain Range in the Cape Peninsula, where it remains the sole flourishing remnant of the ancient forest, coming up naturally, and mixing its soft white foliage in striking contrast with the dark pines.

The following list embraces the chief timber trees of South Africa :—

Common Name.	Botanical Name.	Weight of a cubic foot (dry) in lbs.
Stinkwood	<i>Ocotea bullata</i> (E. Mey) ...	49
Sneeze-wood	<i>Pteroxylon utile</i> (E. and Z.) ..	68
Upright Yellowwood ..	<i>Podocarpus latifolia</i> (L'Hérit.) ..	37
Outeniqua do.	<i>Podocarpus elongata</i> (L'Hérit.) ..	29
Black Ironwood	<i>Olea laurifolia</i> (Lamk.) ..	61
White Ironwood	<i>Toddalia lanceolata</i> (Lamk.) ..	57
Wild Olive	<i>Olea verrucosa</i> (Link.) ..	71
Assagai	<i>Curtisia faginea</i> (Ait.) ..	58
White Pear	<i>Apodytes dimidiata</i> (E. Mey) ..	52
Ker-sewood	<i>Pterocelastrus variabilis</i> (Lond.) ..	52
Wit-Els	<i>Platylophus trifoliatus</i> (Don.) ..	38
Saffraan	<i>Eleodendron croceum</i> (D. C.) ..	54
Vlier	<i>Nuxia floribunda</i> (Benth.) ..	47
Red Els	<i>Cunonia Capensis</i> (L.) ..	47
Esenwood	<i>Ekebergia Capensis</i> (Sparm.) ..	40
Hard Pear	<i>Olinia cymosa</i> (Thunb.) ..	68
Buckenhout (Cape Beech)	<i>Myrsine melanophloeos</i> (R. Br.) ..	45
Kamassi	<i>Gonioma Kamassi</i> (E. Mey.) ..	58
Mountain Pear	<i>Cathastrum Capense</i> (Turcz.) ..	56
Cape Chestnut	<i>Calodendron Capense</i> (Thunb.) ..	39
Kafir Coral or Boom ..	<i>Erythrina Kaffra</i> (Thunb.) ..	16
Kafir Plum	<i>Harpephyllum Kaffrum</i> (Bernh.) ..	39

SCRUB FOREST.

The scrub forests, though occupying the largest area, are at present of little economic importance, and can be dismissed in a few words. In the present state of the country they will not pay the expenses of survey, demarcation, or strict conservation. Their water-retaining action is but of secondary importance. On the other hand, they are not liable to be destroyed by fire, and when near centres of population form valuable fuel copses. The desolate Addo Bush near Port Elizabeth has for many years furnished fuel to that town. From thence, lining the valleys of nearly all the rivers, the scrubs extend eastwards up the coast through Cape Colony, the Transkei, Natal, and Zululand; the number and tropical character of the species gradually increasing. On the coast of the Knysna Division, Alexandria Division, and at various points in the Transkei, the coast scrub rises to low timber forest. Further inland, where it becomes too dry even for the scrub forest, are often found extensive tracts occupied by the grotesque and useless cactus-like Euphorbias. These could probably be reclaimed by plantations of the Aleppo pine (*Pinus Halepensis*) and the edible olive. The nearly allied wild olive (*Olea verrucosa*) is a common tree of this region.

In 1886 a true species of Boxwood (*Buxus Macowanai*, Oliver) was discovered by the Forest Department in the coast scrub forest near East London. It was at once shipped to Europe in large quantities. With it was sent a boxwood substitute—Kamassie—from Knysna. Cape Boxwood was pronounced inferior in some respects to the boxwood of commerce. Kamassi wood resembles commercial Box still less. The enterprise was discredited, and little has been shipped since. The Box forests of East London form patches of what is known as pure forest (composed of one species), and with their dense shade and clean soil are picturesque, and a welcome relief from the interminable thorny bush which usually constitutes the bulk of the scrub forests. A stunted Sneezewood, producing the inferior "round" fencing pole, grows in the scrubs. Very superior Sneezewood came formerly from the Alexandria forests, and is exported still from the coast forests of the Transkei.

The Lignum vitæ of South Africa—Umzambiti—(*Millettia Caffra*, Meisner) is a small tree of the coast scrubs, with a white sapwood, and a rich dark red heartwood. It is a favourite wood for walking sticks; and as the outcome of some carefully conducted experiments with axles running at great speeds in diamond cutting machinery, Umzambiti was pronounced superior to Lignum vitæ for machinery bearings. Umzambiti is not only harder than the Lignum vitæ of commerce, but has been found to carry

an axle with less friction. It was proposed at one time to use it in the propeller bearings of steamships. The greatest obstacle to its use for this and other allied purposes is the difficulty of obtaining sound wood of any size. The tree, as it stands in the forest, is so deeply buttressed, that it has the appearance of a bundle of stakes grown together into a single bole.

THE FOREST DEPARTMENT.

The Cape Forest Department is charged with the protection and management of the Crown forests. It undertakes, in addition, the encouragement of general tree-planting by the distribution of plants and seeds free, or on a moderate payment, to the public. Another of its duties is the inspection and control of the Government-aided municipal tree-planting. In many parts its most arduous task is the working of the Forest Act.

The Forest Department at the Cape was placed on its present footing in 1883, the services of two professionally-trained forest officers being obtained from Europe and from India. A forest officer from the Cape is now going through the official course of instruction in forestry at Cooper's Hill, London.

Cape Colony and the Transkei now form four Forest Conservancies: (1) The Western, or Cape Town; (2) The Midland, or Knysna; (3) The Eastern, or King Williamstown; (4) The Transkei.

Each Conservancy is administered by a Conservator of Forests, with a staff of assistants (termed District Forest Officers), of Rangers, and of Foresters. The Natal Government has lately secured the services of a professionally-trained forest officer from Germany. Reckless management has reduced the timber forests of Natal to less than one-quarter of their former area.

The prudent administration of the Chartered Company is in striking contrast. There is already a Forest Department in Mashonaland, with an officer at its head who did good service in the Cape Forest Department. Within the last few weeks a forest ranger has been appointed to Bechuanaland.

The forests of Cape Colony are now managed on the method that is the outcome of two, and sometimes of three, centuries of experience in Europe. In 1883 this system was introduced at Knysna, and the demarcation of the Eastern forests begun. In 1888 the Forest Act was passed, legalising the various Conservancy regulations, and constituting the demarcated forests a national trust for the benefit of the people of this country, and their children after them. Previous to 1883, forest management in Cape Colony was but a repetition of the oft-told tale of waste, neglect, and final destruction by fire.

CHAPTER VI.

THE CAPE OF GOOD HOPE;

ITS DISCOVERY AND OCCUPATION BY EUROPEANS.

THERE is much that is unique in the history of the discovery and early occupation of the Cape of Good Hope. Ancient tradition, handed down to us by the old Greek writer Herodotus, tells of a voyage round Africa having been performed by Phœnician seamen, who started from the Red Sea and returned by the Mediterranean, in the time of Pharaoh Necho, six centuries before the Christian Era. The only object seemingly attained was the determination of the insularity of the Continent. Many authorities, however, regard the tradition as apocryphal, deeming it improbable that such a feat as a voyage of three years over so extensive a circuit of the ocean could have been accomplished with the fragile galleys of the early mariners. Others maintain that extensive as the voyage was, the primitive craft of the Phœnicians, accustomed to coast along the Red Sea and the Gulf of Persia to India, might, in similar manner, have safely doubled the promontory of the Cape. On this point they have the supporting statement of Herodotus, that the Phœnicians, following the indentures of the coast, repeatedly spent periods on shore, where they drew their boats on land, sowed grain in favourable places, waited till the crops ripened under a tropical sun, reaped them, and then continued their progress; and on their arrival in Egypt, recounted as a phenomenon "that in sailing round Africa they had the sun on their right hand"—a strong confirmation of the probability of their geographical achievement.

Written records of the commerce of the ancients with the East Coast of Africa do not date further back than the first century of the Christian era. At that time navigation extended from the Red Sea and South Arabia to Quilloa, and probably as far south as Sofala. The mariners of the period knew that the sea was further navigable to the south-west, but had no idea of how or where the continent ended. This shows that whatever knowledge may have been acquired by the Phœnician explorers sent out by

Pharaoh Necho, it was not utilised or followed by any results. To the world, South Africa remained an unknown land until near the close of the fifteenth century, when the Portuguese navigators solved the problem of an ocean route between Europe and the East.

In 1486 (six years previous to Christopher Columbus starting on his first voyage across the Atlantic, which resulted in the discovery of America), the King of Portugal, John II., sent out two ships of fifty tons each, and a tender laden with surplus supplies of food, to proceed along the west coast of Africa, beyond the points which had been previously explored, in the hope that they might reach its further extremity, and so discover a passage to India. Bartholomew Diaz, one of a family of daring navigators, was in command of the expedition. Early in the following year he unknowingly doubled the Cape. At the mouth of the Orange River, on the west coast, a strong wind carried his ship for several days due south; when it abated he steered in an easterly direction, with the view of striking the land, but finding none, altered his course for the north, and came into Flish Bay, near Gauritz River, on the eastern side of the Cape Colony. Continuing eastward he entered Algoa Bay, and on a small island, which still bears the name of St. Croix, set up a stone pillar and cross, as a token of possession and symbol of the Christian faith. He was eager to prosecute his mission still further eastward; but the protests of the crews of his ships, who were worn with fatigue, and alarmed at the heavy seas they passed through, compelled him not to proceed further than the Rio de Infanta, now known as the Great Fish River. On his return voyage Diaz sighted the remarkable mountain range of the Cape Peninsula, and named its southern point Cabo Tormentososo, or Stormy Cape; but when he arrived at Lisbon, the King of Portugal, appreciating the value of the discovery, and foreseeing the early realisation of the long-coveted route to India, bestowed upon it the name of good omen by which it has been known ever since—the “Cape of Good Hope.”

In the same year (1487) the Portuguese king, seeking by every means to secure the success of the enterprise which he was determined to prosecute, sent two officers, Pedro de Covilham and de Payva on a mission to Cairo and Aden, to gather all the geographical information they could regarding the East. At Aden, Covilham embarked in an Arab vessel for Calcutta and Goa, and afterwards crossed the Indian Ocean to the African coast at Sofala, where he learnt of its gold mines, and procured intelligence which satisfied him that the dream of Prince Henry the Navigator could be realised. He sent messengers to his royal master,

reporting that ships, sailing from Portugal down the coast of Gamia might be sure of reaching the termination of the continent by persisting in a course to the south; and that when they should arrive in the Eastern Ocean, their best direction would be to inquire for Sofala and the Island of the Moon (Madagascar).

With this valuable information in his possession, Vasco da Gama, in 1497, started from Lisbon on his memorable expedition, which practically accomplished and opened up the sea route to the East. He safely doubled the Cape, touched at Mossel Bay and Natal, passed the low-lying land of Sofala in the night, got to Mozambique and Melinda (where the Arab traders were then exchanging their commodities for the gold of Sofala), and finally reached India in the month of May, 1498, after a voyage of eleven months.

The Portuguese did not make any permanent use of the promontory which they had discovered and given an enduring name to. For more than a century they passed and repassed it, occasionally resorting to its waters for shelter and refreshment. Table Bay was usually the point touched at; and there, in 1510, Francis d'Almeida, the first Viceroy of the Portuguese East Indies, while on his way home with a return fleet, met with his death on the beach in an affray with the Hottentots. Afterwards the English and Dutch began to share with the Portuguese in the lucrative commerce of the Orient, and frequently availed themselves of the Cape as a place of call, using it as a primitive post office—letters or dispatches being left under large stones, on which the name of the vessel and the date were graven for the information of ships expected to follow.

In 1620, two zealous Englishmen, Captain Andrew Shillinge and Captain Humphrey Fitzherbert, commanders of a fleet of four ships of the East India Company, then in Table Bay, of their own motion landed and issued a proclamation of British sovereignty over the Cape Peninsula and adjoining territory in the name of their sovereign King James the First. But neither King James nor the English East India Company saw the value or importance of assuming dominion or occupation in South Africa then, and declined to confirm the action.

The Dutch were more alive to the advantages which would accrue to their commerce by having a permanent half-way station there in connection with their navigation in the Eastern seas. As early as 1602, the various private companies organised in Holland for trade with the East were, in order to avoid the evils of competition, amalgamated and formed into a sovereign company, similar to the British Chartered Companies of the present day.

They were constituted under a charter granted by the States-General of the Netherlands, which delegated to them the several powers of government, and the monopoly of trade eastward of the Cape of Good Hope, or westward of the Straits of Magellan. In a comparatively short period they secured for themselves the best marts in the Eastern seas, and gradually expelled the Portuguese from nearly all their territorial possessions. In 1648 one of their richly-laden homeward bound ships, the *Haarlem*, was wrecked in Table Bay, and the crew of that vessel, on finding their way back to Holland, enlarged upon "the fruitfulness of the soil, the temper of the air, the facilities for fattening cattle, and the favourable character of the natives," and strongly recommended the advantage of establishing a station at the Cape. The idea was taken up and acted upon by the Netherlands East India Company, who accordingly ordered possession to be taken of Table Bay, and a fort to be built and gardens laid out there.

The command of the expedition, fitted out for this purpose, was given to Jan Anthony van Riebeeck, a surgeon in the employ of the company, who had previously sailed with outward-bound ships to the Cape and India. He left the Texel on the 24th December, 1651, with three ships, the *Dromedaris* (which carried his flag), the *Reijger*, and the *Goede Hope*, and anchored in Table Bay on the 6th of April, 1652. The daily life he and his companions led from the date of their arrival is minutely detailed in the quaint and interesting journals and despatches of Van Riebeeck, which are still preserved in the Archives of the Colony. Their first act was to supplicate the blessings



COMMANDER VAN RIEBEEK.

of heaven on their work; "that the interests of the East India Company might be promoted, justice maintained, and the true Reformed Christian doctrine implanted and propagated amongst the wild and savage inhabitants of the land." The

site for a fort was selected on a spot about half-way between the present Cape Town railway station and the Castle. The work of erecting it was rapidly advanced, and a residence for the commander and stores were built. While this was being carried on, steps were taken for supplementing the food supplies of the garrison. Few natives visited them for some time, and all they were able to procure from them in the shape of cattle were a lean cow and calf. Wild game, described as "harts and elands," were numerous, but much to their vexation could not be approached within musket shot. Fortunately, Table Bay yielded fish in abundance, and Robben Island furnished sea-fowl eggs, penguins and young seals, which were salted and divided among the people as a change of diet. The winter season which set in, especially during the months of July and August, proved an exceptionally severe one. The weather was bleak and stormy, the mountains were white with snow, and so much rain fell that "the land resembled a sea." There was much sickness and some deaths; and the men of the garrison began to murmur. One of them who "wished the purser at the devil for serving out penguin flesh instead of pork," was punished with one hundred blows from the butt end of a musket. Another, who with three companions deserted, and set out inland in the hope of escaping from the country, but returned after four days, asking for mercy, was tried and sentenced to be keel-hauled, to receive one hundred lashes, and serve the year in chains—such being the modes of punishment in those early days.

With the advent of the Cape spring, when the verdure of the hills and the valleys afforded pleasure to the eye, the privations and discomfort of the winter were forgotten. They had the satisfaction of seeing the vegetable and other seeds which they had sown, starting from the virgin soil; and soon enjoyed the first products of their own planting. After this their circumstances began to improve. The natives brought in cattle and sheep, exchanging them for pieces of brass and copper wire, and tobacco; with the frequent addition of a "pimpeltje," or dram of brandy. Elephant and hippopotamus tusks, ostrich eggs, and occasionally feathers, and young ostriches were also received from them. The country around Table Mountain was explored, and found to contain fine forests, as well as fertile lands, suitable for cultivation or pasture. Van Riebeeck actively engaged with his own party in the work of cultivating the ground and the breeding of stock. Wheat, barley, oats, and maize were sown with success. Vines, introduced from the Rhine, were soon propagated, and a small quantity of wine made. The orange, olive, mulberry, fig, peach, apple, and various other fruit trees

were planted. Horses were got from Java, and woolled sheep, pigs, dogs, and rabbits, from Europe. Expeditions were from time to time sent inland to "penetrate the secrets of the Dark Continent," and especially to endeavour to find a route to the territory of Monomotapa on the highlands of the Zambesi, in order to tap its trade from the south, for the benefit of the Dutch East India Company. Van Riebeeck thought that if the people of Monomotapa once became acquainted with the Hollanders, and compared their kind treatment with the imperious domination of the Portuguese, they might be induced to bring their "gold, ivory, and pearls," overland to the Cape, instead of to Sofala and Mozambique. But, although one or two parties of volunteers, encouraged by rewards offered by the government, made feeble attempts to explore the country, the fabled "Land of Ophir" was never reached by them.

After eleven years of service, Van Riebeeck found the Cape Settlement "a lonesome melancholy place, where there was little to be done but to barter for sheep and cattle with the stupid, lazy, filthy Hottentots." He took credit for having accomplished what he had been sent to do. He had converted Table Valley from a dry waste into a convenient place for the refreshment of the outward and homeward bound fleets. Thirty-two tons of grain, the produce of one harvest, were stored in the granaries, and cattle were regularly supplied by the Hottentots, with whom he was in amity. His zeal, industry, and devotion to the Company were acknowledged by his appointment to the government of Malacca, and later on he filled the office of Secretary to the Council of Batavia. His son, born at the Cape in 1653, rose to the position of Governor-General of the Dutch East Indies.

The aboriginal race inhabiting the country at this time were known by the name of Hottentots, from the peculiarity of the "clicks" used in the pronunciation of their language. The title adopted by themselves was *Khoi-Khoi*, signifying the men of men. In appearance they were of a medium height; their bodies were slender, but well proportioned, with small hands and feet. Their skin was of a yellow, olive colour; face oval, with prominent projecting cheek-bones; eyes dark chestnut or black, and wide apart; nose broad and thick and flat at the root; chin pointed; and mouth large, with thick turned-up lips. Woolly hair grew in short curly tufts on the head, and the beard was very scanty. The females were rather smaller than the males, and among them *steatopygia* was a common characteristic. They were a nomadic, pastoral people, migrating with their herds and flocks wherever good grazing was to be found. Their dwellings were a framework of sticks, bent and lashed together, and covered with reed

mats. Of tillage or agriculture they knew nothing. Their food was chiefly the flesh and offal of animals or game killed in hunting, milk, edible roots, and wild fruits. Their weapons were the assegai, club, and arrow. They clothed themselves in sheepskins, and loved to besmear their bodies with greasy substances. A preparation of charcoal and fat, and the powdered leaves of *Diosma*, called by them Bucchu, was held in high estimation for this purpose. Van Riebeeck had more than once to lament the loss of a suit of clothes from the fervour with which some of them embraced him, while they were thus besmeared with grease. Their natural disposition was mild and placable, they were most friendly and hospitable, and amongst themselves held in contempt the person who could eat, drink, or smoke alone.

They had no national organization, but were divided into several hordes or clans, each having its distinctive name and chief. Those spread over the Cape Peninsula were known as the Goringhaikas, or Kaapmen, and claimed to be the occupants of the country from time immemorial. Allied with them were the Gorachouquas, who received the name of tobacco thieves, because they had stolen the first crop of tobacco grown by the colonists. In addition to them were a small body, who had no live stock and subsisted by fishing, and were termed by the new comers "strand-loopers," or beach-rangers. Then came the Chochoquas, or Saldanhers, who roamed about with considerable herds of cattle and sheep between False Bay and Saldanha Bay. The Little Chariguriquas had their kraals about Durban and Groenekloof, in portion of what is now the district of Malmesbury. To the north-west, from Clanwilliam to the Orange river, were the Namaquas, who had large herds of cattle and possessed ornaments manufactured out of copper and iron. In alliance with the Namaquas were the Great Chariguriquas (the progenitors of the Griquas of to-day), who were then living near the Oliphant's river. More to the eastward, near the sources of the Breede and Hex rivers, in what are now the districts of Tulbagh and Worcester, were the Chainouquas, whose chief Sousa, in 1660, visited Van Riebeeck in great state mounted on a red ox, and accompanied by his son's wife on a white, spotted one. Along the Breede river—the Swellendam district—were the Heusaquas, and beyond them, along the eastern coast, were the Hamcumquas, Attaquas, Outeniquas, Damaquas, and Gonaquas, extending as far eastward as the Keiskamma and Great Kei rivers. Besides these, there was another branch of them, sometimes referred to as Souquas, at other times as Obiquas, and afterwards as "Bushmen," who appear to have been widely spread, generally occupying the rugged and mountainous

parts of the country. They were low in stature, clad in skins like the Hottentots, and spoke like them, "clucking like turkey cocks." They had no cattle nor any property of their own, but lived from hand to mouth on the game they hunted, the honey they gathered, or the roots they obtained in the fields.

The intercourse and relations between the new and the ancient occupiers of the country at the outset were carried on in a very amicable and humane spirit. The Hottentots showed a good disposition towards the Dutch; and the Dutch, in accordance with the orders issued by the East India Company, sought by kindness and favours to gain their confidence and goodwill so as to do a profitable business with them, and to secure safe travelling inland. After a time, however, the pilfering and thievish habits of the "beach-rangers" became very annoying, and one morning a European youth engaged in herding cattle on the Lion's Hill was found to have been murdered by them, and all the cattle carried off. Even under this provocation the Commander forbade any reprisals, lest the innocent should suffer for the guilty, and directed that the natives were to be treated with as much or even more kindness than before, so that the Company's traffic in cattle might not in any way suffer. The Commander found that the Hottentots were not always disposed to barter their stock for the copper wire or tobacco which were the usual medium of exchange. For weeks or months at a time they would pasture their flocks and cattle within sight of the fort, but refuse to come near or part with any. More than once Van Riebeeck recorded in his journal how vexatious it was to behold so much cattle, and yet be unable to obtain any, either by good treatment or barter; and how easy it would be, if he only got the orders from his masters, to "cut off ten thousand head of them, and seize as many of the savages for transmission as slaves to India." But propositions of this nature got no encouragement from the Company, who desired to keep peace with the tribes and respect their property.

About three years after the foundation of the settlement a suggestion was made for the encouragement of colonisation by the emigration of free families to be settled near the fort, with a view to strengthen the garrison and reduce the Company's expenditure. Van Riebeeck reported favourably of the plan, recognising that it would contribute to the maintenance of the authority and defence of the Company, and that in course of time the land occupied or brought under cultivation by the colonists would be able to bear the imposition of such burdens as would recompense the Company for any outlay incurred. It was not, however, until the beginning of 1657 that the final arrangements for this departure in policy were concluded. As all

endeavours to get persons to emigrate from Holland to the Cape for such a purpose proved unsuccessful, it was resolved to make a commencement with those accustomed to the place and acquainted with the country. Nine soldiers and sailors in the service of the Company, all described as Protestants and of good character, were granted their discharge and permitted to settle as free burghers on lands allotted them along the banks of the Liesbeek river, at Rondebosch. A few were also permitted to maintain themselves by their trades around the fort. Some of them soon discontinued their farm work and returned to the Company's service; but from time to time new men of different nationalities—Germans, Danes, Portuguese, Flemish and Dutch—got their discharge and tried their fortunes as colonial proprietors, until in 1670 they numbered about ninety men. These were the beginnings of the "boer" and "burgher" population of South Africa.

They were supplied by the Company on credit with cattle, implements and seeds, with which to carry on their operations. As no servants were to be obtained from the Hottentots, who could not be induced to work, the services of a few of the single men of the garrison were lent to them, and afterwards slaves were imported for them. They were allowed as much land as they could bring under cultivation, and were exempted from the payment of taxes for three years, but subsequently were liable to an assessment, which was fixed at one-tenth of all produce raised from their lands, and a tenth of all stock from the pasture lands they were allowed to occupy. They had the privilege of catching fish for their own consumption, and of disposing of such of their fruits and vegetables as the Company did not require to the crews of the Company's ships in the harbour. But they were not permitted to sell any farm produce or any stock, except to the Company, and at stipulated prices. For a short while they were at liberty to purchase breeding cattle from the natives, provided the articles employed in barter had been previously purchased from the Company; but this permission was revoked, as the competition of the burghers raised the price of cattle, and trade in any form either with natives or foreigners was prohibited.

The first establishment of this small colony of burghers brought to an issue the question of territorial and native rights. When the Kaapmen Hottentots, in the course of their periodic migration, returned to their old pastures along the Liesbeek river, they found the white man ploughing the land where they had been accustomed to graze their cattle and dig out roots or bulbs for their winter food. They then realised that the Europeans intended taking permanent possession of the country,

and according to the words of one of them, they resolved to prevent it, and to "dishearten the intruders by taking away their cattle, and if that did not produce the effect, then to burn their houses and corn until they were forced to go away." They called the tribe of Gorachouquas to their aid, and swept off a number of the colonists' cattle. So commenced the first Cape colonial war, which occurred in 1659. The colonists and garrison at the time were few in number, but they were fortunately reinforced by the crews of some vessels which had put into Table Bay. Hostilities continued for many months; and after two engagements, in which seven natives were killed and one of their leaders wounded, they came to the Company's Fort sueing for peace, which was at once concluded. Both parties agreed not to molest each other in the future, and the Salt and Liesbeek rivers were recognised as the boundary of the colony.

The Dutch East India Company's hopes of a peaceful occupation of the Cape were rudely dispelled by these hostilities with the Hottentots; and they feared frequent repetitions of such conflicts with one or other of the more inland tribes. They wrote: "The discontent shown by these people in consequence of our appropriating to ourselves—and to their exclusion—the land which they have used for their cattle from time immemorial is neither surprising nor groundless, and we therefore should be glad to see that we could purchase it from them, or otherwise satisfy them." This suggestion of purchasing territory was carried into effect a few years afterwards. A purchase was made in 1672 from two of the Hottentot chiefs, who claimed to be hereditary sovereigns, of all the country from the Cape Peninsula to Saldanha Bay, "lands, rivers, creeks, forests, and pastures inclusive," but with the condition that where the colonists did not occupy the arable lands or pastures, the natives might erect their kraals and graze their cattle freely. The purchase amount of this cession was paid for in brandy, tobacco, beads, and merchandise of the value of little more than one hundred florins, or about ten pounds sterling.

After this, no further question arose as to the Company's dominion over the soil. As the Europeans extended their occupation of the country the Hottentots receded. Feuds and quarrels among themselves, the depredations of the Bushmen, who constantly waged war upon them, and sometimes acts of rapacity and violence committed by some of the burghers, who, in defiance of the law, engaged in cattle-dealing, gradually led to their impoverishment and disintegration. Many of the Kaapmen crossed the range of mountains behind Hottentots Holland and moved inland, and later on others followed their example.

The Chocoquas and Namaquas retired northwards towards the Orange River and the country beyond it, where their descendants still dwell. The other clans were decimated by disease. Small-pox, which broke out at the Cape for the first time in 1713, spread amongst them with great and fatal violence. The historian Valentyn says: "They declared the Dutch had bewitched them with the beads and trinkets bartered to them, and throwing them away, they fled into the country. They died in such multitudes, that everywhere they lay unburied along the roads and highways." In the following year, of all the various hordes about the Cape, whose names have been preserved by Van Riebeeck, few were to be found; most of them had disappeared from the scene, or merged imperceptibly into the other inland clans. Struggling remnants of the latter continued for a while to maintain their independence in the south-west and eastern districts, living in small kraals or societies; the rest sought service among the colonists as herdsman, or became hangers-on about the Company's cattle-posts and farms.



THE OLD CASTLE GATE, CAPE TOWN.

Soon after Van Riebeeck's departure, in 1662, it became an accepted policy of the Dutch East India Company to plant a colony at the Cape, and his successor received instructions that a strong stone fortress, capable of holding a large garrison, should be constructed for its defence, in the place of the old fort, whose earthen walls were crumbling away. The castle—a good specimen of the ancient style of fortification, still standing in Cape Town—was commenced in 1666, a force of several hundred men being landed from the passing fleets to proceed with the work; but a period of about fourteen years elapsed before it was finally

completed. During all this time there were very few accessions to the number of colonists. Agriculture and the development of the country were therefore at a standstill; according to the testimony of one of the agents of the Company, the place was daily retrograding. The farmers complained that, after spending toil and labour on their lands and stock, they

were denied a free market and a fair price for their produce. Repeatedly they approached the authorities, setting forth their grievances, and asking that they might be placed in a better position to enjoy the fruits of their industry; but their remonstrances were characterized as "sedition and mutiny," and with heavy hearts they found themselves compelled to submit to the yoke of their masters, or be deported as "useless subjects" to Mauritius, Ceylon, or Batavia. The severe and rigorous system enforced by the Company was freely commented upon by some of its own officers. Commissioner Verburg, in a memorandum on the condition of the Cape in 1672, wrote: "The colonists here bear the name of freemen, but they are so limited and restrained in everything, that the absence of freedom is only too evident. The orders and proclamations issued from time to time are too minute, and in some respects rather too rigid, and if acted upon to the letter, would produce the utter ruin of the burghers. This cannot be endured by a new and growing colony, which requires to be fostered with more freedom, gentleness, and kindness." Representations such as these led to the Company now and again authorising the raising of the price of grain and other produce, so that the farmers might be able to maintain themselves, and not acquire a distaste for labour; but otherwise there was no change made in the administration of affairs.

In 1679, Simon Van der Stell was appointed to the command of the Settlement. After Van Riebeeck, he was in every way the most conspicuous figure among the early governors. He strongly pressed upon the Company the importance of increasing the free population, urging that the colony had "excellent land in abundance only awaiting labourers to till it." In response to his appeal, which was strengthened by the recommendation of Commissioner Baron van Rheeде van Drakeenstein, then visiting the Cape, another attempt was made to induce persons of the agricultural class in Holland to emigrate to South Africa, and about fifty mechanics and farmers, and a number of young women from the orphan institutions of Amsterdam and Rotterdam, were provided with passages in the outward bound fleets, and comfortably settled among their fellow-countrymen.

It happened about five years after this that Holland was receiving with sympathy and kindness the Protestant Huguenot refugees, who were driven from France upon the revocation, by Louis XIV., of the Edict of Nantes, which granted them religious liberty. The States-General of the United Provinces proposed to the East India Company that they should offer to some of these "exiles for religion's sake" a home in their African possessions. Accordingly a scheme for their emigration

was planned. The conditions and regulations laid down provided that they were to take the oath of fidelity to the Company, have free passage to the Cape, and continue there for full five years; that they should settle and maintain themselves by cultivation, tillage, or handicrafts; that to those applying themselves to farming should be given as much ground as they could bring under cultivation, and in case of requiring it, they should be furnished with all implements necessary, and even seed, upon condition that they should afterwards reimburse the Company for such advances in corn, wine, or other goods.

These refugees, numbering in all about 300 men, women, and children, arrived in the Colony during 1688 and 1689. The public records contain a register of their names. Among them are those of Du Plessis, Malherbe, Rosseau, Fouche, De Villiers, Du Toit, Malan, Marais, Jourdan, Mesnard, Du Pré, Notier, Le Febre, Cordier, Retief, Theron, Hugo, Joubert, Le Roux, Le Grange, Labuscagne, and others, whose descendants are now widely scattered over the whole of South Africa. The greater portion of them upon their arrival, were placed on lands along the Berg River Valley, where they soon cultivated "the cornfields green and sunny vines," with which they had been familiar, and the French names they gave to their farms, such as Le Parais, Lamotte, Cabrier, Normandy, Rhone, Champagne, Languedoc, and the "Fransche Hoek," remain memorials of the localities where they fixed their abodes.

One of their countrymen, François Leguat, who visited the country in 1698, has given a pleasing description of their condition and surroundings at that time: "In some parts of the Cape," he says, "the landskips are wonderfully fine, especially where our new inhabitants were settled, and the air is admirably good. Fine and large riverlets contribute to the fertility of the soil, which furnishes wine in abundance, with all sorts of corn. The little hills are covered with vines, exposed to the best sun, and sheltered from the bad winds. Spring-water flows at the foot of these hills, and waters in its course the gardens and orchards, which are filled with all sorts of fruits, herbs, and pulse, as well European as Indian. One of the refugees, named Taillefer, a very honest and ingenious man, and curious above all things in these particulars, has a garden which may very well pass for fine. Nothing there is wanting, and all is in so good order, and so neat, that it may very well pass for charming. He has likewise a great yard very well filled, and a large quantity of oxen, sheep and horses, which according to the custom of the country feed all the year without-doors, and find so great plenty of nourishment, that they have no occasion for winter fodder.

This generous man receives and regales all those that are so happy as to come and see him. He has the best wine in the country, and which is not unlike our small wines of Champagne. All this considered, it is certain the Cape is an extraordinary refuge for the poor French Protestants. They there peaceably enjoy their happiness, and live in good correspondence with the Hollanders, who, as every one knows, are of a frank and downright humour."

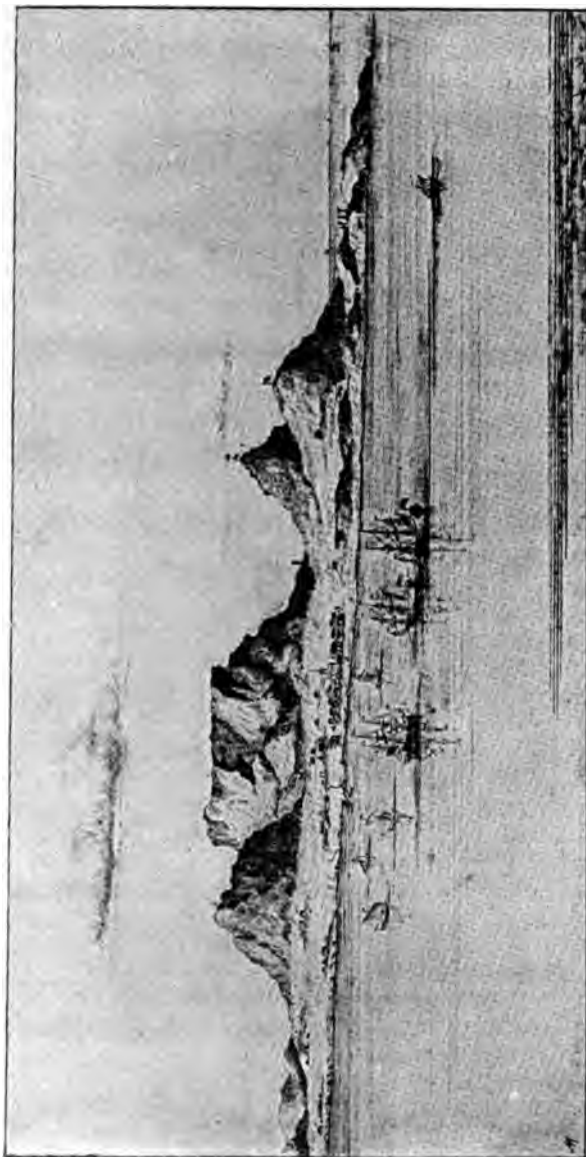
A minister of the Walloon Church, the Rev. Pierre Simond, accompanied the Huguenot refugees, and remained with them for a few years, holding religious services for them in the French language on alternate Sundays at Stellenbosch and Drakenstein. This community at Drakenstein after a time endeavoured to consolidate themselves, and applied for the privilege of forming a separate congregation and electing their own vestry. A deputation of their leading men waited upon the Governor and his Council with this request. Van der Stell was enraged at the proposal; he regarded it as the first move in a plot on the part of the emigrants to withdraw their obedience from the Company, and to choose their own magistrates and rulers. The deputation met with a peppery reception from him, and were dismissed with a severe reprimand "to restrain their French impertinences, and remember the oath of fidelity and obedience to the Company which they had taken." Soon afterwards they were all incorporated with the Dutch Reformed Church, the authorities not permitting any other ecclesiastical establishment or worship in the Settlement. Instructions were also given that the use of the French language should be discouraged as much as possible, so that it should in time entirely die out, and that nothing but Dutch should be taught to the young to read and write. In 1709, the use of French in addressing the Government upon official matters was publicly forbidden; and in 1724, the reading of the lessons at the church service in the French language took place for the last time. In little more than half a century after the arrival of the Huguenots, French had almost ceased to be spoken among their children, who, by marriage and social connections, had become merged with the Dutch and Germans around them, using the Dutch language only.

In 1699 Governor Simon Van der Stell retired from office to dwell upon the beautiful wine-farm near Wynberg, which he had laid out and planted, and named "Constantia." During his administration the town of Stellenbosch was founded, and the valleys now known as Drakenstein and the Paarl were settled. He personally led an expedition which explored the then far distant copper regions of Namaqualand, where rich specimens of

ore were found, but abandoned as useless owing to the difficulty of transport. To him and to his son, William Adrian Van der Stell, who succeeded him, belong the distinction of successfully acclimatising and planting European trees, such as the oak, fir, and poplar, to which the Cape owes the grand leafy avenues, which are the admiration and delight of the present generation.

Shortly after the accession of Adrian Van der Stell to the Government, the burghers, who up to that time had been remarkably peaceful and industrious, began to feel that their privileges were being more and more restricted. The governors and officers of the Company were permitted to supplement their incomes by engaging in private trade; grants of land were given them to carry on farming, and they could dispose of their produce in competition with the burghers. Both the Governor and his brother had private estates at Hottentots Holland; their father, the late governor, had one at Constantia; the clergyman of the Cape likewise had a farm at Zandvliet, and the burghers felt that they were subjected to ruinous rivalry from their operations. In 1807 a memorial to the directors of the Company in Holland, setting forth their grievances, was secretly framed, and signed by sixty-three persons. In this document they complained, among other things, of the "unrighteous and haughty tyranny" of Governor Van der Stell, by whom they alleged they were grievously oppressed and treated as slaves. They charged him with having abused the privilege of his position by employing the Company's servants and slaves at his farm; that he had, in an underhand manner, enriched himself by barter with the natives, and taken their cattle by violence; that, in the name of his brother and other friends, he furnished the Company's magazines with wheat at higher prices than he paid the farmers; that, while he compelled them to deliver wines at a low price, he disposed of them to some foreign ships at ten times what they cost him; that persons who wanted titles to land could not obtain the same unless the solicitation was accompanied by a *douceur*, "for the Governor listened readily to reasons that jingle"; and that at his caprice he monopolised the pastures for his own cattle and those of his brother and father, and that the latter was guilty of the ruinous oppression of his neighbours.

When it came to the knowledge of Van der Stell that a document of this nature had been secretly forwarded to his lords and masters, the East India Company, he instantly commenced proceedings against all whom he suspected of being disaffected. By proclamation he declared that those engaged in securing signatures in opposition to Government should be punished with death as violators of the public peace. Many



CAPE TOWN AND TABLE BAY IN 1714.

[To face page 183.

were arrested and committed to prison, others were put on board ship and sent to Batavia and Holland, while some succeeded in secreting themselves in the inland parts of the country till the storm blew over. Among those sentenced to banishment and carried to Holland by the homeward-bound fleets were three colonists—Messrs. Peter Van der Byl, H. Huising, and Van der Heiden, who carried with them the original of the memorial against the Governor, and who, upon their arrival in Amsterdam, were instrumental in gaining powerful friends to take up the case of the burghers, and finally obtained the recall of Van der Stell and his principal officers.

The details of the entire proceedings, showing the peculiar relations between the Governor and the governed in those early days of the Cape Settlement, are set forth in a number of cumbersome pamphlets in folio, printed in Holland at the time, and illustrated with engravings of the Governor's farm at Hottentots Holland, known as Vergelegen (now the property of the Theunissen family), displaying the mansion, farm-houses, parks, and vineyards, with lions, tigers, and buffaloes grazing in the background. Governor Van der Stell, in his defence against the accusations of the colonists, asserted that the hatred of a small but violent portion of them was excited against him in consequence of his strict adherence to the orders of the Company in the prevention of persons engaging in illegal traffic with the Hottentots and smuggling transactions with the Dutch and foreign ships; and on these grounds the falsehoods set forth in the memorial had been invented.

The Dutch East India Company expressed their dissatisfaction at these grave commotions and differences between the colonists and the government. They directed that the Governor, the Secunde or Assistant Governor, the clergyman, and the landdrost of Stellenbosch, should all be deprived of authority and office; and subsequently they were dismissed from the Company's service. The sentences of imprisonment and banishment against the colonists were annulled, and all were restored to their former position. Lands owned or leased by officers of the Company were ordered to be disposed of, and officials were forbidden in future to possess any land other than a small garden plot, or to traffic in any farm produce. All this, it was stated, was done "for the quieting of disorder and the restoration of tranquillity."

When Adrian Van der Stell was removed, Governor Louis Van Assenburg was appointed in his place, and he again was succeeded by Governor Mauritz Pasques de Chavannes in 1714. The free burgher population of the whole country at that time numbered 647 men, 341 women, 467 sons, and 484 daughters.

They had 93 men servants, 1,178 male slaves, 240 female slaves, and 221 slave children. Cape Town contained about 300 houses, besides the castle and other buildings belonging to the Company, and the Dutch Reformed Church with its tower and spire. There had been few accessions to the number of colonists after the Huguenot emigration. The principal additions came from the ranks of the Company's servants, who were allowed to obtain burgher privileges, but with the reservation, that, if necessary, they might be recalled to their former position and pay.

The general powers of government were exercised by the Governor and a council composed of officers of the Company, who were responsible to the directors in Holland. One or two of the burghers had a seat and vote with them in the Courts of Justice when any case affecting burgher interests was being heard. As representing the proprietors of the settlement, the Governor and council controlled and regulated the importations, productions, and trade of the community. According to the orders of their masters, the colonists might not buy any imported article but what came from the Company's stores, and they were bound to dispose of their corn, wine, and cattle to the Company at prices varying with the fluctuating demands of its agents. Foreign or coasting trade was forbidden them. Only the surplus of such products as remained, after all the wants of the Company were supplied, might be sold to the crews of foreign ships in port; and even this limited commerce was subject to the permission of the Fiscal, and the payment to him of a fee for the privilege. The exaction of dues and fees, which went to supplement the inadequate pay of the officials, was incidental to nearly every business transaction. When crops of grain were raised in excess of the requirements of the Company, orders were given to restrict production; at other times, when the presence of foreigners advanced the prices of produce to a high rate, the delivery of articles at a fixed price was enforced by penalties. In 1723 an order of the council directed that every one selling fresh meat to foreign ships was liable to be banished. At the same time it was ordered that no vegetable even was to be sold to foreign ships, and no cabbages to be pickled for exportation to India; everything was to be kept for the Company's ships and the public. All offenders against this regulation were directed to be prosecuted as disobedient and obnoxious inhabitants, and defrauders of the Company's interests. Such restrictions as these upon production and trade naturally repressed all enterprise, and checked the development of the country.

Many of the colonists unable to endure the system which prevailed near the capital crossed the mountain ranges and

passed into the inland plains. There they obtained a subsistence by imitating the native mode of life, killing game and grazing cattle. Others soon followed their example. The authorities, although at first opposed to the movement, after a time discovered it to be of some advantage, as it "would add to their revenue, and increase the food supplies of the settlement." In 1705, they gave their formal sanction to the occupation of new tracts of territory by issuing "loan leases," or squatting licences, to such as preferred a request for them, but always subject to the condition of resumption of the property at any time by the Company. Wherever there was vacant land, whoever chose to do so might apply for it; and if, after temporary occupation, he found any difficulty in securing permanent waters, or in grazing his cattle, he immediately enlarged his range, and moved further into the interior. It was in this manner that the early Cape "Boers," or farmers, began the nomad habit of "trekking," which has been continued by their descendants along the border of the European settlements until the present time.

This dispersion of the European population was in many ways detrimental alike to themselves and their descendants. In the inland districts, then designated "Overberg" (beyond the mountains), they were scattered at distances far apart from each other, and quite isolated from the outer world. They had to supply their needs from the limited products of the country; for they were without markets, roads, churches, schools, or any of the conveniences that make life desirable. Happily, they carried with them their Huguenot custom of family worship, and daily, in wagon, tent or hut, the head of the household read from the cherished Bible such lessons as served to maintain the principles as well as the forms of morality and civilization among them.

Governor-General Imhoff, who visited the Cape in 1743, and inspected the country for some distance inland, reported that the state of the farmers in the remote districts was most lamentable, and he represented that if their children were further neglected they would lapse into barbarians. As a remedy, a magistracy and church were established at Swellendam in 1745, the Gamtoos River being then declared the farthest limit of the settlement. But when the colonists spread to the Brintjes Hoogte, Camdeboo, and the Sneeuwberg mountains, a magistracy was established in 1786, at Graaff-Reinet, and the Great Fish River was proclaimed as the territorial boundary of the Company's possessions.

Although measures had, from time to time, been taken to confine the inhabitants within the limits of these districts, the Government were never really able to control or restrain them. From the Castle at Cape Town proclamations and placats were

issued forbidding any burgher to leave his loan-farm, without permission, on any pretext whatever, "or to proceed into the interior on pain of corporal or capital punishment, aye, even to the death, and the confiscation of all property." But these orders were treated with indifference and contempt, and many of the border farmers moved on from one place to another as their fancy led them, some as elephant hunters crossing the boundary after the large game, and others as "togtgangers" or traders, bartering goods with the natives around or beyond them. Under these circumstances, collisions and conflicts with the native races were inevitable.

The colonists passing northward, through the Karroo plains, encountered the hostility of the Bushmen, who were widely spread over the country from the Roggeveldt and Camdeboo mountains to the Orange River. The white man destroyed their game, and they retaliated by taking the white man's cattle. Then followed reprisals and acts of violence and revenge; and the miseries which fell to the lot of both colonists and aborigines at this time form one of the saddest pages in the annals of the country. In the absence of military protection, the farmers, who almost from their youth were expert in the use of fire-arms, assembled for mutual defence, and proceeded in pursuit of depredators, or attacked those by whom they were threatened or disturbed. These armed assemblages were called "Commandoes," and the system was recognised by Government, who appointed a Field-Commandant to each district and a Field-cornet to each sub-division of a district. The Government, however, owing to its distance from the common scene of hostilities, and also from the want of a true knowledge of the state of things there, exercised but little control over them. For nearly thirty years there was continuous fighting with the Bushmen, apparently producing no other effect than to render them the implacable enemy of the white man, and finally resulting in what was virtually a war of extermination. The old records of Graaff-Reinet show that between 1786 and 1794 upwards of two hundred persons were murdered by the Bushmen, and that the number of the latter killed by "Commandoes" was not far short of two thousand five hundred.

Those of the colonists who were advancing eastward encountered the formidable Kafirs of the Ama-Kosa nation. Some of the latter had been, for years previously, steadily encroaching upon and conquering the Gonaqua Hottentots, westward of the Kei and Keiskamma rivers. About the time of their first conflict with Europeans, they appear to have been engaged in intertribal war with some aboriginal neighbours; and the clans who were worsted

by their foes crossed to the western side of the Fish river, which had been declared the boundary of the Colony. Here they committed aggressions on the colonists. Amicable means were tried to induce them to retire to their side of the boundary line, but all were futile. Commandoes of the burghers were then assembled under Commandant Von Jarsveld, who successfully repulsed the Kafirs in several encounters, and drove them back across the Fish river, capturing large herds of cattle, which were distributed among the forces. This, the first Kafir war, occurred in 1781.

About this period the struggle between England and her American colonies had been some time in progress, and Holland having become allied with France, was an active enemy against England. War with that country was accordingly declared, and the British Government planned an expedition in 1781 to seize the Cape of Good Hope. This intention became known through a spy named De la Motte, and a French fleet, under Admiral Suffren, was without delay despatched for the protection of the Dutch Company's possessions at the Cape. On its way out, off the Cape Verde Islands, it accidentally met with the English fleet, under Commodore Johnstone, equipped for the capture of the Cape. After a severe engagement, in which the English ships were more or less disabled for a time, the French Admiral pursued his way to Simon's Bay where he landed his troops, who were immediately marched to Cape Town. The presence of this force, composed chiefly of mercenary legions, saved the Cape from conquest. Commodore Johnstone, following after Admiral Suffren and finding him in possession of the defences, did not attempt to make any attack, but contented himself with the capture and destruction of a valuable fleet of the Dutch Company's homeward-bound ships, including the "Middelberg," which had taken shelter in Saldanha Bay. During the continuance of the war, however, all communication with Holland ceased, and to meet the exigencies of the Cape settlement, loans of money were raised from the colonists, and a paper currency was thrown into circulation by Governor Van Plettenberg, with a promise that the same would be afterwards redeemed. On the resumption of peace the pledge was only partially fulfilled, and for some years after paper continued to be the prevailing medium for commercial transactions.

In the meantime, the colonists around Cape Town were trying to make their voices heard with a view to bringing about a change in the system of trade and government. Feeling themselves hampered in their internal commerce, they sought to be allowed to participate in a free trade along the coast and to Sofala, Mozambique, and Madagascar, but their application did

not meet with any favourable response. In 1779 they asked for permission to send representatives to Holland to state their case; but this also was refused them. Four of their number—Messrs. Jacob van Reenen, Barend J. Artoys, Tielman Roos, and N. G. Heyns—soon afterwards took ship for Europe, carrying with them a memorial signed by several hundreds of their fellow-burghers, which they found means of placing before the Company. In this memorial they charged the Governor, Joachim von Plettenberg, and his officials with various acts of oppression and corruption. They complained of the arbitrary power exercised by the authorities of seizing any of the inhabitants, and deporting them, against their will, to the Indian factories. They asked for a reform of the Court of Justice, and to be allowed a voice in the Council of Policy. They prayed that all burghers might be entitled to sell freely to foreign vessels without paying fees to the Fiscal. And, as on previous occasions, they petitioned to be allowed the right of trading beyond the colony in ships freighted by themselves, in order to barter their produce for that of other lands.

After a considerable lapse of time, some of the demands of the colonists were met. Regulations were promulgated to check the abuses, on the part of officials, which had been complained of, and a reform of the Court of Justice was effected by the admission to it of an equal number of burghers and officials. But the concession of free trade and foreign commerce was still denied them. "If that were granted," said one of the officials (the Fiscal Boers), "the Cape would soon be no longer a subordinate colony, but an independent State." The matter, however, was not allowed to rest. The colonists, in 1785, again sent delegates, who bore the names of Redelinghuys, Roos, and Bresler, to appeal once more to the directors of the Company, and, failing redress, to approach the States-General of the Netherlands.

The long-continued prosperity of the Dutch East India Company was at this time rapidly on the decline. Its finances were in confusion, and there were complaints of misgovernment in other of its possessions besides the Cape of Good Hope. The Stadtholder of the Netherlands, in 1791, appointed two Commissioners, Messrs. Nederberg and Frekenius, to inquire into the affairs of all the settlements. On their arrival at the Cape in 1793 there was a general expectation of the redress of abuses, and of reform in the system of administration; but the result gave little satisfaction to the colonists. The Commissioners reduced the establishments of the Company, and imposed new taxes. They fixed a price at which the Company was to be supplied with as much grain as it needed, leaving the farmer at liberty to export any surplus they

had to India or Holland, provided it was sent in Dutch vessels. The coast ports were declared open for trade, but the exportation of goods in foreign vessels and traffic with foreigners, except for provisions, was prohibited. A Loan Bank was created to assist the inhabitants by enabling them to get advances on mortgage bonds and other securities, and the people were admonished by proclamation not to live beyond their means. The Commissioners then proceeded to Batavia, leaving the Cape in charge of Commissary-General Sluysken and the chief officers of the Company as a Council of Regency.

Internal troubles had meanwhile been accumulating. The absence of any controlling power on the part of the government in the remote districts produced its natural effect. Many of the border colonists, when called upon to contribute their share of the taxes, repudiated their obligation to pay anything for lands which they said they had been obliged to defend at their own expense without any assistance from the State. They complained of the restrictions on the sale of produce, the inconvenience and loss occasioned them by the depreciation of the paper currency, and of the unsatisfactory relations existing with the natives, some of them demanding that the Bushmen and Hottentots who were captured in arms against the colony should be compelled to serve in bondage. In February, 1795, the burghers of Brintjes Hoogte assembled at Graaff-Reinet. They declared themselves "unwilling to obey the Dutch East India Company any longer, and that they would be independent," and ordered their landdrost, or magistrate, to quit the Drosty with all that belonged to him within a few hours. Having no force to support him, the magistrate was constrained to comply. In June of the same year the landdrost of Swellendam was in similar manner expelled by the burghers of his district, who appointed a landdrost and what was termed "a national assembly" of their own. There was a general spirit of disaffection to the rule of the Dutch East India Company throughout the inland districts; but at this very juncture, when the disagreement between the people and the government seriously threatened the tranquillity of the country, an unexpected solution of the difficulty was brought about by the course of political events in Europe.

After the French Revolution, the armies of the Convention, in 1795, overran Holland. It became, for a time, a French province, and the Stadtholder, the Prince of Orange, had to flee as a refugee to England, where he continued to co-operate with the Allied Powers against France. It was feared the Dutch Colonies would share the misfortunes of Holland; and the importance of the Cape as a maritime station, at the extreme point of the

African Continent, was recognised. "Whoever is master of the Cape," wrote Sir Francis Baring, "will be able to harass British troops going and returning from India." The British Government, therefore, resolved to make themselves master of it. A squadron of war-ships, with a large body of troops, under Admiral Elphinstone and General Craig, was dispatched from Spithead, and the exiled Prince of Orange, acting in concert with the British, addressed a letter to the authorities at the Cape, to receive the fleet as allies come to protect the Colony against any invasion by the French. The Acting Governor, Commissary Sluysken, and his Council in Cape Town had received instructions from the Chamber of Seventeen, representing the Company, to oppose the landing of any force, as it was impossible to foresee the turn events might take. They accordingly informed the British Commanders that they would defend the Colony against any fleet or army sent against them, whether French or British. They had no adequate force, however, to maintain their position—the military, the burghers, and the Hottentots who came to their aid numbering little more than 3000 men. Their chief attention was devoted to the strengthening of the military port at Muizenberg, between False and Table Bays. From the natural advantages of the position it was regarded as another Thermopylae, where any troops marching on Cape Town could easily be held in check by a few brave, determined men. A well-equipped battery and an artillery force were placed there, and the heights and ridges of rocks above the position were occupied by sharpshooters. As the British land force advanced along the shore of False Bay, the ships of the fleet co-operated with them, and the heavy fire from their guns on the battery at Muizenberg compelled the Dutch artillery to seek shelter. The simultaneous appearance of the land force on the scene threw the whole camp into confusion, and the Dutch troops hurriedly beat a retreat, leaving behind them guns, tents, and ammunition. The British were not in a position to follow up their success immediately, as they possessed no cattle or carriage for transport; but soon afterwards they were reinforced by the arrival of more ships with troops and stores, and on the 16th September, 1795, marched on to Rondebosch, within a short distance of Cape Town, where articles of capitulation were signed by Commissary Sluysken and his Council, surrendering the castle and town to the King of Great Britain. With this act the rule of the Dutch East India Company in South Africa came to a close.

From 1779 to 1803, the Cape was held temporarily by the English Government as a possession by conquest. The inhabitants were guaranteed the preservation of all the privileges they

formerly enjoyed, and it was announced to them that the monopolies and restrictions on trade, which had hitherto prevailed for the benefit of the Dutch East India Company, were at an end. Every person was free to sell his own produce to whom and in what manner he chose, as best suited his interests, and there was no restraint as to the navigation of the coast, or the manner in which the produce might be conveyed to a market. At Cape Town a large armed force was maintained, and there was a profuse expenditure of money. It was estimated that during these years more than a million sterling of English money was spent in the Colony, whose exports at that time did not exceed £15,000 per annum, and whose European population of all ages and sexes was not above 25,000 in number.

In the inland districts, affairs were for some time in an unsettled condition. At Swellendam, after the capitulation, the former landdrost was reinstated. At Graaff-Reinet, the inhabitants refused to take the oath of allegiance, and evinced as little respect for the newly appointed magistrate as for the late officers of the Dutch East India Company, whom they had sent about their business. After a time, however, they submitted to the ruling power, and for a few years tranquillity ensued. Then again disturbances occurred which led to most unfortunate results. The Court of Justice in Cape Town had issued a decree for the arrest of one of the leading farmers, named Van Jaarsveld, who had been commandant of the burghers. The charge against him was that of falsifying a receipt, with the object of defrauding the Orphan Chamber. His friends and neighbours conceived the idea that his arrest was due to the part he had taken in the previous rebellion. Acting upon this, a body of them rescued him from the officers escorting him to the capital; and then marched upon Graaff-Reinet, where they had summoned the farmers of the district to assemble in arms. When this intelligence reached Cape Town, the Acting Governor, General Dundas, immediately despatched troops inland under the command of General Vandeleur, who followed up the insurgents to Brintjes Hoogte, where they finally surrendered and laid down their arms. The leaders and others who were considered culpable were apprehended and sent for trial before the Court of Justice, where some were condemned to death, and others were ordered "to be delivered to the executioner blindfolded, and having kneeled down upon a heap of sand, to have the sword waved over their head for punishment, and then to be banished for the remainder of their lives from the settlement." But owing to various circumstances the execution of the sentence was postponed from time to time,

and the prisoners were finally set free, on the restoration of the Colony to Holland.

During this insurrection, when the British troops marched through the inland districts, numbers of the Hottentots, excited by the commotion, flocked after them. Some came from their kraals; others availed themselves of the prevailing disturbances to abandon the service of the farmers, which they complained had been cruel and oppressive to them. When the insurgents surrendered, these Hottentots took advantage of the opportunity of possessing themselves of some of their weapons; but the general tranquillity of the country demanded their being disarmed, and this was accordingly done. Their disarmament made them suspicious of the intentions of the English towards them, and when, upon order being restored in the district, they saw the troops being withdrawn, they dreaded the probability of having to return to the service of the masters from whom they had fled, and whose anger and ill-will they feared. Some of them asked the authorities to provide means for their subsistence, and allot them certain unoccupied lands. Their appeal did not receive immediate attention; and, with characteristic imprudence and fickleness, a considerable number of them joined their barbarous neighbours, the Kafirs, who were then investing the country from the Bushman's to the Sunday's River, and aggressively advancing on the Europeans. The Kafirs welcomed the Hottentot reinforcement to their side, as several of them were possessed of, and accustomed to the use of, firearms. Immediately upon this union, they set about plundering and burning the farmers' houses, in many cases murdering the defenceless inhabitants on the threshold of their dwellings, and desolating the whole country from the Sunday's River westward even to Langekloof and Knysna.

The border farmers were confounded by this unexpected invasion. They assembled for common defence from all the districts, and commandoes of burghers from the neighbourhood of the capital also took the field, together with the troops. General Dundas, remembering the unfortunate events at San Domingo, and Hayti, in 1791, feared the most serious consequences would follow from a war of races, if the anarchy which prevailed was not suppressed. He counselled that the Hottentots should be appeased by all fair means, and secured the services of Mr. Maynier (a former magistrate of Graaff-Reinet) to approach them, and, if possible, establish a truce with them as well as with the Kafirs. After much trouble this was accomplished, and hostilities terminated. But for a long period afterwards a state of unrest continued throughout the land, combined with a bitter feeling against the Hottentots, who still roamed about the country.

These commotions which afflicted the border districts at the time were attributed by the authorities to the turbulent character of many of the inhabitants, and their treatment of the natives by whom they were surrounded. The British Secretary of State, commenting upon the circumstances reported to him, wrote in July, 1800: "Considering the tract of country over which these border inhabitants are dispersed, the rude and uncultivated state in which they live, and the wild notions of independence which prevail among them, I am afraid any attempt to introduce civilisation and a strict administration of justice will be slow in their progress, and likely, if not proceeded upon with caution and management, rather to create a spirit of resistance, or to occasion them to emigrate still further from the seat of government, rather than answer the beneficent views in which they might be undertaken. In fact, it appears to me the proper system of policy to observe to them is to interfere as little as possible in their domestic concerns and interior economy; to consider them rather as distant communities dependent upon the Government rather than as subjects necessarily amenable to the laws and regulations established within the precincts of Government. Mutual advantages, arising from barter and commerce, and a strict adherence to good faith and justice in all relations with them, joined to efficient protection and occasional acts of kindness on the part of the Government, seem likely to be the best means of securing their attachment." It was not until after the lapse of half a century that the wisdom of this policy was recognised, and the course indicated by it was adopted.

The peace of Europe, secured by the treaty of Amiens, brought the Colony back to its relationship with Holland, and in 1803 the country was evacuated by the English. Mr. De Mist, a member of the Council for the Asiatic Possessions (by which department the business of the Dutch East India Company had been latterly administered), was appointed as Commissary-General for the Batavian Republic, to receive the Colony from the English, and to install the new Governor, General Janssens, into office. Upon the arrival of these functionaries they announced to the inhabitants that the settlement would be no longer dependent upon any commercial body, and that the people would in future know no other Government than that which the Batavians had appointed over themselves; and they expressed the hope that all former contentions and divisions between the inhabitants, as well as the turbulent opposition shown to the constituted authorities, would be buried in oblivion. The Commissary-General was chiefly occupied with the organisation of the civil government, and his liberal and benevolent views are set

forth in various measures then prepared by him for the conduct of public affairs. The Colony was divided into five districts, each administered by a landdrost, who was to be assisted by six of the principal domiciliated burgher inhabitants and owners of property, termed "Heemraden." These had to act judicially in certain cases, and to consider and determine upon all district matters, such as the protection of property, questions of land boundaries, water rights, the planting of woods and preservation of forests. Acting upon the principle "that the Colony must derive its importance from the quantity and quality of its produce," the landdrosts were enjoined to pay particular attention to the improvement of agriculture, wine and fruit growing, and the breeding of cattle; to encourage the formation of artificial pastures, and to provide stalls for the protection of stock in winter, and especially to promote the exchange of the native hairy sheep for the wool bearing merinos, which it was wisely prophesied would be an inexhaustible source of prosperity. The civilization of the Hottentot race was to constitute one of the objects of their care; they were to be considered and treated as a free people, having a legal right of residence. The different tribes on the frontier were also directed to be so dealt with that they could not have any just cause for aggression against the inhabitants; and as long as the use of slaves in the Colony was not abandoned, they were directed to watch over the protection of these unfortunate beings, and by authority and example to accustom the inhabitants to consider and treat them as fellow-creatures, and not suffer any cruelty to be practised upon them. In addition to these general instructions, laws were made relating to ecclesiastical matters, schools, a militia force, district courts, and the appointment of field-cornets—some of which are still part of the code of the Colony.

Governor Janssens gave his attention to the condition of the border districts. He visited the frontier settlers and some of the Kafir and Hottentot chiefs, endeavouring to re-establish a peaceable understanding between them and the colonists. In many places he witnessed the deplorable results of the disturbances which had occurred—houses in ruins, fields desolated, and numerous families impoverished, wandering about homeless, and living scantily upon the small remnants of cattle they had been able to save from the hands of their invaders. A number of the farmers were induced to return to their old habitations and commence life anew. At Graaff-Reinet a new Landdrost, Mr. Stockenstrom, was appointed, under whom tranquillity was restored; and the district was subdivided, another magistracy being formed at the Zwartkops River Valley, to which the name of "Uitenhage" was given. Between the Sundays and Fish Rivers, however, the country was still

occupied by Kafirs, who were then in revolt against their paramount chief, Gaika. They acknowledged the Fish River was the boundary of the Kafir territory, and promised to return there as soon as they had conquered or were reconciled to their chief, with whom they were at war. But these promises were never fulfilled. All the endeavours of the Dutch Border Commissioner to induce them to quit the Colony and retire to their own country were in vain, and the Government had no force to compel them. The military establishment of the Cape was very far short of what Governor Janssens considered it ought to be, but the finances of the Batavian Republic were too impoverished to permit of its increase, or even of its continued maintenance. In the mother country the machine of government was merely kept going by economising in all directions, and some of their statesmen even mooted the question whether the possession of the southern point of Africa was of any importance to Holland, especially in view of the fact that its lot would always depend upon the position of political affairs and final peace negotiations in Europe.

The course of events soon demonstrated this. The peace of Amiens proved to be of short duration. War was again declared in Europe. Hostilities were resumed between England and France, and the importance of the Cape as a naval and military position being again recognised by the British Government, an expedition for its re-capture was sent out under the command of General Sir David Baird. The fleet conveying this force reached the Cape on the 5th January, 1806, and took up a position in the channel between Robben Island and Blueberg, on the northern side of Table Bay, facing Cape Town. The troops effected a landing, although the sea was breaking on the shore with great violence. They moved off—about 4000 strong—in the direction of Cape Town, but on rounding the spur of the Blueberg Hill found themselves confronted and opposed by the Batavian and Colonial forces under General Janssens. An engagement ensued, but shortly after fire was opened the Waldeck battalion of the Batavian troops began to retire, and the whole of the defensive force soon afterwards gave way. Next day the British troops advanced and took possession of Cape Town, and after a truce and some preliminary overtures, terms of capitulation were signed by General Janssens, one of the conditions being that the Batavian troops should be embarked and sent straight to Holland, at the expense of the British Government; and another was that the burghers and inhabitants should preserve all the rights and privileges hitherto enjoyed by them. These articles of capitulation were ratified and confirmed in the Castle on the 19th January, 1806.

This closed the administration of the Dutch Government in South Africa. At the final conclusion of the Napoleonic war in Europe, in 1815, the King of the Netherlands, by convention, and in consideration of a payment of between two and three millions sterling towards the settlement of the Low Countries, finally ceded the Cape of Good Hope, along with other possessions, in perpetuity to the British Crown.

CHAPTER VII.

BRITISH RULE DURING THE CENTURY.

FROM the date of the surrender of the Cape to the British forces under General Baird in 1806, the country virtually became a British colony, although the final cession of it by Holland to Great Britain only occurred after the Congress of Vienna, some eight years later. At that period, the total population numbered 73,663 souls, of whom 26,720 were of European descent, 17,657 Hottentots, and 29,256 slaves. The imports did not much exceed £100,000 per annum, and the exports were not above £60,000.

The Governors appointed by the British Crown to administer public affairs exercised supreme power and authority, showing, however, a conservative regard for the old laws and institutions of the settlement, and in the distribution of patronage they conciliated the feelings of the Dutch colonists by judiciously appointing many of them to various offices in the civil service. Earl Caledon, who held office from 1807 to 1811, opened up postal communication with the inland districts, and established circuit courts to administer justice among all classes with the same power and authority as the Court of Justice in Cape Town. He also issued regulations with the object of restraining the Hottentots from leading a wandering, indolent life, and securing to them protection when they entered the service of the inhabitants. Sir John Cradock, in 1812, placed the tenure of land throughout the colony on a permanent footing. The holders of "loan-leases" were allowed to convert the same into perpetual quit-rent properties, to which they obtained title, enabling them to transmit the same hereditarily, or to do with their lands and tenements as they thought proper. He also opened public schools in the country districts, providing for the first time for the education of the scattered people. He likewise freed the eastern border from those sections of the Kafir tribes who had intruded into the country between the Fish and Sunday's Rivers. The basis of his action in this matter was to secure the undisturbed occupation of the territory surrendered by the Dutch, and put an end to the continual complaints of Kafir depredations.

A military force, under command of Colonel Graham, aided by

burgher forces headed by Mr. Stockenstrom, the magistrate of Graaff-Reinet, and Major Cuyler, the magistrate of Uitenhage, entered the bushy country around the Zuurberg and Rietfontein mountains, and after two weeks' operations succeeded in clearing it of the Kafirs, who with their wives and cattle retired to the east of the Fish River. Mr. Stockenstrom sacrificed his life on this occasion by placing a fatal confidence in a party of Kafirs whom he met on the top of the Zuurberg mountain. Accompanied by some of his burgher officers, he dismounted and conversed with the Kafirs; urging them to retire to their own country, and assuring them not a shot would be fired if they did so quietly. The Kafirs pleaded that they had bought the land they occupied, and paid a number of cattle for it to some Dutch Commissioners, and that it was not right for the Government to expel them. While the "palaver" was proceeding, some natives arrived, who reported that blood had been shed. The character of the meeting immediately changed. The Kafirs fell upon Mr. Stockenstrom and his party, nine of whom they put to death; the others managed to effect their escape.

For some time after the expulsion of the Kafirs, the military and burghers continued to guard the boundary west of the Fish River. Colonel Graham urged that the vacated tract should at once be occupied, and the former residents of the districts invited to return to them: but the Governor opposed this, as he sought to maintain the country as "neutral ground," and only sanctioned a small number of farmers being encouraged to settle there, for the convenience of the supply of the troops at the military headquarters, which received the name of Graham's Town.

Lord Charles Somerset succeeded Sir J. Cradock as Governor in 1814, and he conceived a policy of recognising the supremacy of the Kafir chief Gaika over all the other tribes inhabiting the border, and of maintaining pacific relations with them by means of his controlling power. An interview with Gaika and some of the other chiefs was held on the frontier in 1817, and an arrangement was come to acknowledging Gaika as the supreme authority in Kafirland. Tribal feuds soon after broke out, and a fierce intertribal war ensued, in which the colony became involved as the ally of Gaika. The result was that the coast tribes, headed by T'Slambie, invaded the border divisions, and attacked Graham's Town, the headquarters of the troops, and the depôt of stores and ammunition. The Kafirs, numbering many thousands, formed into three columns, and, sounding their wild war cry, advanced to the assault with great impetuosity, but they were gallantly encountered by a comparatively small body of men forming the garrison under Colonel Wilshire. A destructive fire of artillery

and musketry was brought to bear upon them, and although some of the foremost warriors bravely rushed on to the muzzles of the guns, hurling their assegais at the artillerymen, they were forced to retreat, leaving hundreds of their killed and wounded behind. Since that time none of the native tribes have attempted an assault upon any colonial town.

At the termination of hostilities a new disposition of the country was made for the better defence of the border. It was stipulated with the chiefs that the Chumie and Keiskamma Rivers should be the eastern boundary, and that the country to be vacated as far as the Fish River should remain unoccupied as neutral ground. One of the reasons for this arrangement was that the occupation by the Kafirs of the thickets along the Fish River exposed the frontier to invasion, which even the established posts had been unable to check. At the same time provision was made for placing Christian missionaries among the Gaika tribe, the Rev. Mr. Brownlee and the Rev. W. R. Thomson being appointed to reside with them, in order to cultivate friendly intercourse and diffuse Christianity and the arts of civilised life.

Prior to 1820 the only accessions to the population of the Colony from the United Kingdom had been a few merchants and traders, and the civil and military officers appointed to the station. Lord Charles Somerset, during his visit to the frontier, was so favourably impressed with the appearance of the country west of the Keiskamma and Fish Rivers, which he described as "unrivalled in the world for its beauty and fertility," that he recommended the introduction of a body of British emigrants to form a settlement here. The recommendation was made at a most opportune time, soon after the close of the war with Napoleon I., when trade in England was depressed and emigration was looked to as an outlet for the relief of the unemployed. The British Parliament supported it, and voted a sum of £50,000 towards colonising the country. In a very short time no less than 90,000 persons made application for passages, although only 5000 or 6000 of them could be received.

The first transport ships, the *Nautilus*, *Ocean*, and *Chapman*, arrived in Algoa Bay in April, 1820, and during the succeeding months, they were followed by twenty-three other vessels conveying the remainder of the emigrant band. The landing place, then unnamed, was nothing more than a small fishing village,



LORD C. SOMERSET.

surrounded by bare sand hills, with a military post (Fort Frederick) crowning the height above the Bakens River. Sir Richard Donkin, the Acting Governor, anticipated from the introduction of British industry and enterprise the formation of an important commercial town at this place. He named it "Port Elizabeth," after his deceased lady, to whose memory he erected an obelisk on the hill, still known as Donkin's Reserve.

A few detached parties of the emigrants were distributed in the Western districts of the Colony; the Scotch settlers under Mr. Pringle were located on the Baviaan's River, in the Somerset district; but the main body, numbering about 3800 souls, were placed in the country between the Fish and Bushman's Rivers, which received the name of Albany. Among the "heads of parties" were many gentlemen of high acquirements and good family connexions, retired military and naval officers, and other persons of respectability, while the "parties" themselves comprised handicraftsmen and husbandmen.

Arrived in Albany, in a favourable season, all seemed fair and beautiful. Wheat was extensively sown, and nothing could be more promising than the crops in the early stage of their growth; but just as the grain formed in the ear, the blight known as "rust" attacked them and the whole became worthless. Wheat proved a failure, not only for the first year, but for two or three succeeding seasons. This calamity was followed by heavy floods, which caused serious damage to houses and gardens and stock, and subjected most of the emigrants to great privation. Their fellow-colonists and their countrymen in England and in India, on learning of their disasters, generously contributed to their relief. But the liberality of the Government, who through the Commissariat of the army on the frontier continued to supply them with rations, removed anything like absolute want; and the settlers themselves showed a brave determination to endure and make the best of their hardships, believing firmly in the natural resources of the country.

As they became accustomed to the novelty of their situation, several of them realised that it was impossible for families to live on the one hundred acre grants of land which had been allotted them, and they petitioned the Government for an augmentation of their lands, which in some instances was acceded to, while in other cases adjacent grants were obtained by purchase, enabling many of the settlers to pursue the mode of farming—pastoral as well as agricultural—usual in the Colony. Meanwhile, there was a movement on the part of the more energetic and restless spirits to seek other occupations and create new industries. Those who were handicraftsmen found employment in Graham's Town, where

skilled labour was in demand. Others made hunting expeditions into the country eastward along the coast, which was full of game of all kinds, including troops of elephants; and not a few began a contraband trade in cattle and ivory with the Kafirs. This led to the establishment in 1821, of a fair at Fort Wilshire, on the banks of the Keiskamma, where open and legitimate barter was carried on—the beginning of a commerce which soon increased to an extent far beyond what could have been anticipated. Many of the settlers commenced trafficking with small capital, and found their way to the fair on foot or on horseback, or in rude sleighs drawn by oxen; but, pushing trade with energy and skill, not only among the natives, but also among their Dutch fellow-colonists, they ultimately laid the foundations of large and successful mercantile establishments, and accumulated handsome fortunes.

During the latter part of Lord Charles Somerset's administration, charges were brought against him of arbitrary and despotic conduct. He interfered with the freedom of the press, summarily placing it under a censorship; and he refused to sanction the holding of any public meetings for the discussion of public affairs. Against these and other acts the colonists protested and appealed to England. The unpopularity of his government led to the appointment of an Imperial Commission of Inquiry, who investigated the condition of the colony on the spot. Messrs. Bigge, Colebroke, and Blair formed this commission; but before their work was completed, leave was granted to Lord Charles Somerset to return to England, ostensibly to rebut some of the charges brought against him, but really to prepare for retirement from office, which soon followed.

The Royal Commissioners concluded their labours in 1826, and presented elaborate reports, which furnish an interesting review of the past administration of the Cape Government, its finances and trade, and the condition of the population, including the aborigines. The recommendations made by them led to the introduction of many changes, which tended chiefly in the direction of Anglicising the Colony. An Executive Council was appointed to assist the Governor with advice. A Supreme Court of Justice, consisting of a Chief Justice and three Puisne Judges, was established by Royal Charter. A Circuit Court, presided over by one of the Judges, was appointed to sit in every district of the Colony once in every six months. Magistrates were placed in charge of divisions, and to hold court in the district towns as often as necessary—taking the place of the old courts of landdrost and heemraden, composed of the most notable burgher inhabitants. Schools were opened in the chief towns, for the purpose of facili-

tating the acquirement of the English language by all classes of the colonists; competent teachers, chiefly from Scotland, arrived some time previously to carry out this object; and, in 1827, the language of the Mother Country was ordered to be exclusively used in all official proceedings and business.

To many of the old colonists some of these changes were not very acceptable. The substitution of the English for the Dutch language in judicial and other proceedings touched feelings associated with the dearest relations of life. The abolition of the courts of "landdrost and heemraden" did away with the slight share in the business of the country which they enjoyed. The persons selected for the position of heemraden were generally the most influential and intelligent landowners of each district; they served as a link between the authorities and the inhabitants, and their opinion on public matters, as well as their co-operation with the officers of government, proved on many occasions of great advantage and importance. Usually, the Dutch part of the community showed a ready submission and acquiescence in all the measures of the ruling power; but now they began to murmur that "everything was becoming so English that they with their old Dutch habits were no longer in their own country."

There were other innovations which created dissatisfaction. Governor Bourke, who succeeded Lord Charles Somerset, promulgated an ordinance placing the Hottentots and other free persons of colour on a level in the eye of the law with every other inhabitant of the colony. This was the Magna Charta of the aboriginal races; they were no longer to be subject to any restraint on the part of their masters, except under the limitations of the law. It, however, led to the increase of vagrancy.

Soon afterwards the question of the emancipation of the slaves came forward. It was preceded by regulations sent from England and enacted in the colony, with a view of ameliorating the condition of these unfortunate people. These contained provisions which were impracticable in the circumstances of the widely-spread and sparse population of the colony, and the announcement of the intention to enforce them created great excitement. The slave-owners declared they would rather suffer the penalties of the law than obey them, and entreated that they should be suspended or repealed. In the face of this the Government limited their operation to the metropolis and Graham's Town.

At this time a proposal for the gradual but ultimate extinction of slavery originated with the colonists, who were slaveholders, in Graaff-Reinet and Cape Town; this was to free all female children from a certain date to be agreed upon. Some persons began to adopt this plan of manumission, when intelligence was

received that the British Parliament had passed the Slave Emancipation Act. There was no disinclination on the part of the colonists to emancipation on fair and equitable principles; and the announcement that £20,000,000 had been voted by Parliament to compensate the proprietors gave an assurance that just compensation would be given. The official appraisement of the 35,000 slaves in the colony was £3,000,000, and this amount was expected to be paid. A year afterwards it became known that the amount apportioned to the Cape was only £1,247,000; and that the money would be paid in London to all presenting their claims. When this was confirmed, the ferment and excitement among the old colonists was revived. They bitterly complained that the Government, which in former years had imported and encouraged the sale of slaves, should now arbitrarily deprive them of them at a little more than a third of their value. The discontent was increased when they found that the compensation money could only be received in London. Many owners in the country districts became the dupes of agents, who purchased their claims for half their value; others, regarding themselves as unjustly treated, indignantly refused to touch the documents entitling them to compensation—of which £5,900 remained unclaimed.*

Early in 1834, Sir Benjamin Durban arrived as Governor. He had to give effect to the Emancipation Act and also to carry out the details of a retrenchment scheme under instructions from the Colonial Department. The revenue of the Colony for some time before had been inadequate to meet the charges of the civil establishments, and extensive reductions were ordered to be made. The Governor's emoluments were reduced from £10,000 to £5,000, without any allowances; the Commissioner-General's office was abolished; and every official's salary, from the Chief Justice down to a junior clerk, was subjected to some reduction.

He had also to initiate a new Legislative Council, composed of officials and nominated members, which had been granted to the Colony. He had further to carry out a new policy for securing the peace of the frontier by cultivating the goodwill of the chiefs through qualified Government agents to be placed with them. While he was occupied in Cape Town preparing and maturing his plans for giving effect to this policy, the frontier of the Colony was suddenly invaded by Kafir hordes.

* The balance of the Slave Compensation Fund unclaimed and due to the Colony at the National Debt Office in 1843 amounted to £5,906. This sum was transferred to the Master of the Supreme Court of the Cape, and invested by him, the yearly interest being paid to the Education Department in aid of mission schools for negro apprentices.

Two or three years previously, the Kafir chief Macomo with his followers, who were occupying the beautiful valleys near the sources of the Kat River, made a raid upon a neighbouring Tembu chief, and were punished for their misconduct by expulsion. The country vacated was given to descendants of the Hottentot race, over 2000 of whom were collected together and located there. The expulsion of Macomo was followed in 1834 by the ejection of his brother Tyali and his followers from the Gaga River, and their removal across the Chumie River. The military patrol, charged with the duty of removing them, destroyed their kraals and seized some milch cows; a skirmish ensued, and a brother of Tyali, named Klu-Klu, was slightly wounded. "The blood of a chief had been shed." Macomo and Tyali made this a cause of war, Botma, Eno, and other chiefs joined with them, and they were supported and countenanced by the powerful tribe of Gcalekas, under Hintza. Before the morning of the 23rd of December, 1834, 10,000 Kafirs rushed over the border, carrying terror and death into the homes of the astonished and unoffending settlers. The inhabitants, both Dutch and English, living on widely separated farms, had no warning, and could offer no resistance. Within a week fifty farmers were slain, hundreds of homesteads were burned down, and loads of spoil, consisting of horses, cattle, goats, sheep, clothes, and whatever could be laid hold of, carried off into Kafirland.

The Governor, aided by the colonists and the small force of British troops, followed the Kafirs into their own country, and after several months' fighting, succeeded in subduing them. As an indemnity for the war, and a security for the future, British sovereignty was proclaimed over the territory of the defeated tribes as far as the Great Kei River, and about 16,000 Fingoes (remnants of Zulu refugees who were in servitude with the Kafirs) were released from their bondage and located in the colony.

A committee of the British House of Commons was at this time directing its attention to the condition of the aborigines in various parts of the empire. All the abuses and enormities of the early days of colonisation were brought under review. The Secretary of State, Lord Glenelg, imbibed the idea that the invasion of the Cape frontier by the Kafirs was the natural reaction against the white man's encroachments and oppression. He wrote to Sir B. Durban that in his opinion the conduct of the colonists and of the public authorities towards the Kafirs through a long series of years had amply justified their rushing into war; that the conquered had more justice on their side than the victorious party, and that the claim of sovereignty over the new territory must be renounced.

When this despatch of Lord Glenelg was made public, the colonists generally felt keenly the false aspersions thus cast upon their character. They had had no act nor part in the policies of the successive officials who were charged with the conduct of affairs on the border. On the contrary, they had borne the brunt of each native trouble; some had their farms laid waste or their cattle carried off; others had their horses and wagons requisitioned by the Government, or they themselves were forced, under severe penalties, to go on commands and serve, without pay and at their own expense, as soldiers in the field. Those of Dutch or French descent, upon whom the main burden of burgher defence had fallen, were, from causes previously mentioned, already predisposed against British rule; and this last act of the Imperial Government in reinstating the Kafir chiefs as masters of the country from the Fish to the Great Kei Rivers, intensified their aversion to it. Their disaffection displayed itself in a singular form. They resolved to quit the Colony, and seek fresh fields and pastures new, where they would be able to govern themselves without interference.

The project of emigration had suggested itself to many of the old colonists before this, but no organisation existed for giving effect to it. Exploring parties went northwards of the Orange River, and eastward through Kafirland to Natal. They brought reports of extensive and fair pasture lands lying waste and unoccupied. The region eastward of the Drakensberg had, between the years 1812 and 1828, been the scene of barbaric warfare, marked by countless aggressions and wholesale massacre of life. This was due to the sanguinary acts of the chief Chaka, who, with trained and disciplined forces under him, raised the Zulus from an insignificant clan to be a powerful nation. He aimed at universal sovereignty, destroying all other native governments; exterminating such of their subjects as did not accept his rule, and absorbing the conquered into his own followers. The fame of his army spread far and wide; tribe after tribe was invaded, routed, or put to death by them, and in a few years Chaka had paramount sway over nearly all South-Eastern Africa, from the Limpopo to Kaffraria. It is estimated that not less than one million human beings were destroyed during his reign. "He turned thousands of square miles into literally a howling wilderness, shed rivers of blood, annihilated whole communities, converting the members of others into cannibals, and causing misery and suffering, the full extent of which can never be known." His was a violent death. He was murdered by one of his attendants at the instigation of his brothers Dingaan and Umhlangana, who themselves feared being put to death by him. The two brothers

then quarrelled as to who should be chief. Dingaan, however, managed to rid himself of his brother Umhlangana and was acknowledged king of the Zulus. He soon showed that, although less brave and warlike, and not so great a military genius as Chaka, he was more than his equal in craft and savage treachery.

Those of the old Cape Colonists who were bent on emigration began to make a move northwards. The Government was cognisant of the movement, and sought to deter it, but found themselves powerless. Sir Anthony Oliphant, who was Colonial Attorney-General, advised that there was no law to prevent persons leaving one country to try and better themselves in another; the same sort of removal was going on every day from England to the United States. So the exodus continued during the years 1835 to 1837. From Somerset, Cradock, and the Winterberg; from Alexandria and Uitenhage; even from George, Swellendam, and Beaufort West, detachments commenced their march. They sold their properties for what they would fetch, and taking with them their wagons, horses, oxen, flocks, and what they could collect in money, went off with their families to seek their fortunes in the interior.

As pre-arranged, they took their course across the Orange River, fixing upon the neighbourhood of the Baralong village of Thabanchu as their rendezvous. From there some of them advanced in small parties towards the Vaal River, but scarcely had they reached the neighbourhood of the present town of Kronstad, when they were surprised and set upon by native warriors, who cruelly massacred them and carried off their wagons, flocks, and herds. These assailants were Zulus of the Matabele tribe under Moselekatse, who had some years before this rebelled and fled from the chief Chaka, and conquered and depopulated the country south and north of the Vaal River. The unhappy fate of the advanced party made those who followed them more cautious; they formed "laagers," or encampments, by drawing their wagons close together in a circle or hollow square, filling up the openings with bushes, which served as an entrenchment. Moselekatse's forces continued to attack them; but with their firearms they succeeded in keeping them at bay, and as further parties of the emigrants joined them they formed a considerable commando, and proceeded against Moselekatse at his headquarters, Mosega, in the Marico district. There they overcame their savage enemy, who fled with his people to the country between the Limpopo and Zambesi.

In 1837 the emigrants were joined by one who, from the high estimation in which he was held, was received and acknowledged as their leader and chief. This was Mr. Pieter Retief, a descendant of one of the old Huguenot families, who was born and brought

up in the division of the Paarl, near to Cape Town, but had moved thence to the eastern frontier, where he had been resident for nearly twenty years. He organised a simple form of government amongst them, based upon the old regulations in force under the Batavian Republic in the Colony. They then pursued their course towards Natal; where, upon arrival, Retief, with a picked body of men, went on to the headquarters of the Zulu king Dingaan, at Umgunguhlova, beyond the Tugela, to negotiate for a cession of a portion of the territory which was lying unoccupied. Dingaan received them with apparent kindness, and agreed to grant their request on condition of their regaining some cattle which a chief living on the Drakensberg had carried off from him. The service was performed, and the cattle restored, and Dingaan signed a formal deed of cession of all the Natal territory, which was witnessed by three of his counsellors and three of the emigrants. The next morning, as Retief and his party were preparing to leave, Dingaan induced them to come unarmed into the enclosure around his kraal. While there, witnessing a Zulu sham-fight, and partaking of the native beer presented to them by the King, they were all treacherously seized, and savagely put to death.

Immediately after the massacre, Dingaan sent out his forces to exterminate the encampments of the emigrants, who, unconscious of danger, were scattered over the upland country at the base of the Drakensberg. They surprised those who were near the Blaauwkrantz and Bushman's River before daybreak, and indiscriminately butchered and mutilated, men, women and children, five hundred souls in all. A few escaped, carrying the news to the neighbouring parties, who hastily improvised defences by their "wagon-laagers," and women, as well as men, with the aid of their fire-arms, heroically succeeded in keeping in check the masses of savages who assailed them, and finally drove them off.

The survivors, after this dreadful catastrophe, made the best arrangements they could for united defence, resolving to avenge themselves for the innocent blood which had been shed. The English residents at the port of Natal espoused their cause. Both forces took the field against Dingaan, but unsuccessfully—the prestige of victory being with the Zulus. Soon afterwards, however, reinforcements reached the settlers by the arrival of fresh parties of emigrants, among whom was Mr. Andries Pretorius, a farmer from the district of Graaff-Reinet, who was elected their leader and chief commandant in the place of the ill-fated Retief. At the close of 1838, they found themselves strong enough to resume the offensive; and advancing across the Tugela once more, they gave battle to Dingaan and his army of about 10,000 warriors, on Sunday, the 16th December, still remembered as

"Dingaan's Day." The Boer force counted little over 400 fighting men, but they were armed with guns, and entrenched in "laager." The Zulus repeatedly attempted to rush their defences and open their camp, but were beaten off with great loss, and finally routed by 200 mounted men sallying out from the "laager" and charging on both their flanks. This decisive victory for the emigrants was subsequently followed by another expedition against Dingaan, in which his own brother Panda, took the chief part in alliance with the emigrants, and eventually the Zulu King became a fugitive in Swaziland, where shortly afterwards he was killed. The emigrants being now the acknowledged masters of the country, set up Panda as chief of the Zulus east of the Tugela, and occupied themselves with forming their own settlement in the remainder of the territory. They laid out the town of Pietermaritzburg, appointed magistrates, and formed an elective legislative body, the Volksraad, to regulate public affairs.

The Cape Government had witnessed the exodus of the emigrants without adopting any coercive measures to check it, although the Imperial Government intimated its determination to permit of no further colonisation or the formation of any independent States by its subjects in that part of South Africa. After the reported hostilities with the Zulus, a small detachment of British troops was sent by the Cape Governor, Sir G. Napier, to Natal, to occupy the port temporarily in order to give assistance to defenceless persons and to prevent munitions of war being imported for aggressions on the natives. But at the close of 1839, these troops were withdrawn. This step was regarded by the emigrants as an abandonment of the territory by Great Britain, and they immediately hoisted the colours of what they termed the "Republic of Natalia." The Volksraad at the same time asked that their independence should be recognised by the English Government, with whom they were ready to enter into friendly alliance. Meanwhile, correspondence was passing between the Cape authorities and the British Secretary of State on the question of abandoning or resuming occupation of Natal. No conclusion had been definitely arrived at, however, when, in 1842, the emigrants had occasion to send a commando against a native chief on the Pondoland border. The Cape Government foresaw in this act a risk of disturbance on their eastern frontier, and sent a handful of troops (200 men) overland to Natal to resume possession. The emigrants protested, re-asserting their independence, and received the military force with hostile demonstrations. Actual hostilities soon began, Capt. Smith in command of the troops marching on the emigrant camp; but he was repulsed by Pretorius's forces, and obliged to retreat with the loss of several

men and two guns. He and his men were then closely besieged in their camp for two months, almost without supplies. A friendly Natal settler, Richard King, undertook to carry the news of their position to the Cape Colony. Starting under cover of the night, he rode all the way through Kafirland to Graham's Town, effecting the journey in ten days. Reinforcements of troops, under command of Lieut.-Colonel Cloete, were at once dispatched by Her Majesty's ships to Port Natal, where they relieved Capt. Smith's detachment, and dispersed the emigrant force which had attempted to oppose their landing. The leaders of the emigrants after this, seeing that further opposition was unavailing, soon gave way, and signed a treaty of submission, and a general amnesty was granted. On the 12th May, 1843, Natal was by proclamation declared a British colony.

It was not, however, until the year 1845 that a regular government was organised. During the two years' interregnum, Captain, now Major, Smith held occupation as military commandant, while the Volksraad elected by the emigrants attended to civil, judicial, and general matters. At this time, thousands of the Zulu tribe came pouring in across the border, at the Tugela River, to escape the tyranny and cruelty of their chief Panda. Their overwhelming numbers, amounting to nearly 100,000, created a feeling of general insecurity; and the occupants of farms abandoned their isolated positions, declaring that all the evils of the Cape Kafirland were being reproduced around them. The Volksraad passed a resolution requiring the Zulus to remove beyond the northern and southern frontier within fourteen days after receiving notice to do so; and they asked the military commandant to co-operate in putting the order in force. To this measure, however, Major Smith objected. His instructions were to prevent any violent proceedings on the part of the farmers towards the natives, and he urged the Volksraad to wait patiently until the plans for the future management of the settlement were made.

The measures which the new Government announced with regard to the apportionment of land and the location of the natives, disgusted the greater number of the emigrants, who proposed to withdraw from Natal to the inland territory north and west of the Drakensberg. Before this movement was finally accomplished, Mr. Andries Pretorius was chosen to proceed to the Cape and plead his countrymen's suit before the Governor of the Colony. He started on his mission, travelling overland, through what is now the Orange Free State, and on arrival at Graham's Town was bitterly disappointed to find that Sir H. Pottinger, the Governor, refused to see him or to deal with the matter of his complaints, as he was awaiting the arrival of a

successor. Disheartened and mortified, Pretorius returned and reported the result of his mission to his brethren in Natal, who immediately began to "trek" across the Drakensberg.

Sir Henry Smith, the new Governor and High Commissioner, arrived at the end of 1847. He lost no time in visiting the inland territories, and at the Tugela drift he met Pretorius and his followers moving away with their herds and flocks to cross the Vaal River. He heard their grievances and invited them to return to Natal, promising them title and possession of good and extensive farms without delay. But the emigrants resolved to continue their "trek," and seek independence and a home outside the boundary of Natal.

The personal visit which Sir H. Smith had made to the country north of the Orange River, where he discussed affairs with the Boers, the Griquas, and the Basuto and other chiefs, convinced him that peace could not be maintained without some formal government, and so in 1848 he issued a proclamation declaring British sovereignty as far as the Vaal River and the Drakensberg. The northern part of this territory was occupied by emigrants who were for some years settled there and had formed a rude government of their own. Their numbers were greatly increased by other families who had left Natal after the resumption of British authority there, under the idea that in those lands they would not be interfered with by the Government of which they desired to be free. They protested against the assumed British sovereignty, and under the leadership of Pretorius took up arms to prove that they were the majority in the country. They then forcibly escorted the British Resident at Bloemfontein and the other sovereignty officials to the Orange River, where they dismissed them, and declared themselves independent. When Sir H. Smith was apprised of this, he hurried up from Cape Town with a military force against Pretorius and his followers, and meeting them at a place named Boomplaats he defeated and dispersed them. Pretorius was declared a rebel, a sum of £2,000 being put upon his head; but he fled across the Vaal River, where he became Commandant-General of the new republic formed there.

For some time afterwards, the government of the Sovereignty was peacefully maintained, but, unfortunately, tranquillity was again disturbed by petty hostilities between the Basutos and other native tribes, in which the British Resident and the small military force under him became mixed up. For the vindication of British prestige, an imposing force, numbering 2000 troops, was marched into the country in 1852, under the command of Sir George Cathcart, who had then superseded Sir H. Smith as Governor and High Commissioner. The Basuto chief, Moshesh

was called to account, and the battle of Berea was fought, which could scarcely be claimed as a victory; but as the hostile chief, on behalf of his people, immediately made a formal submission, it was accepted, and peace proclaimed.

The question of the retention or abandonment of the territory then arose. Sir G. Cathcart's expedition had convinced him that to obviate the risk of serious consequences, the Government should come to a decision either to abandon the Sovereignty, or place it under a lieutenant-governor and council, with a necessary force of at least 2000 men to support authority and keep in check not only the emigrants of questionable loyalty, but also the petty native tribes and the powerful chiefs of the Zulu and Basuto tribes, Panda and Moshesh. The Imperial Government decided that the project of maintaining the country by a permanent military force of 2000 men was inadmissible, and as no particular British interest was to be served by continuing to exercise sovereignty there, they resolved to withdraw the Queen's authority to the south bank of the Orange River. A pardon was granted to Mr. Andries Pretorius; and on the 17th January, 1852, at the Sand River, a convention was concluded with him and other representatives of the emigrants who were settled across the Vaal, giving them the right to govern themselves without any interference on the part of the British Government. In 1853, a special Commissioner, Sir George Clerk, was sent to carry through the abandonment of the Orange River Territory, which was formally ceded over to certain delegates representing its inhabitants; and the future independence of the country and its government was guaranteed in terms of a Convention signed at Bloemfontein on the 23rd February, 1854. British officials in South Africa were clearly given to understand that from that time forward, they were not to interfere in any wars, however sanguinary, which might occur outside of the colonial boundary, and that the different tribes and communities there, were to be left in a state of independence.



SIR A. STOCKENSTROM.

We must now revert to events in the Cape Colony. In accordance with the policy laid down by Lord Glenelg, the Fish River was fixed as the eastern boundary. Mr. Stockenström was appointed in 1836 to be Lieut.-Governor, with full powers to establish by treaty the new relations with the Kafir tribes,—

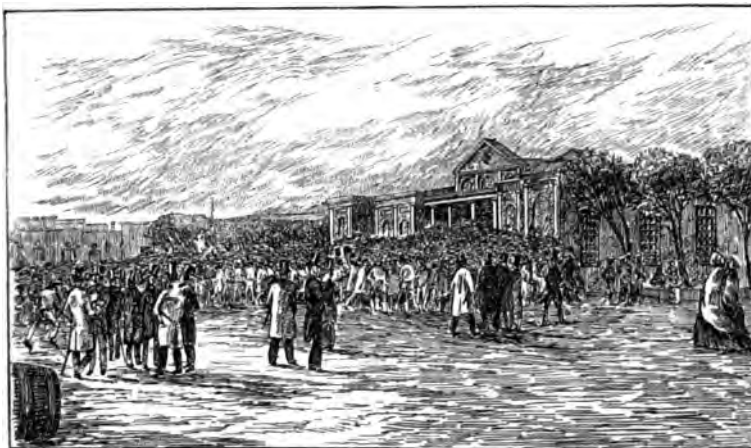
the principles guiding him being the acknowledgment of the independence of the tribes within their own territories; the appointment of British agents to reside with them, through whom all intercourse between the colonists and natives should be regulated, while the chiefs on their part should undertake to find and restore, or give compensation for any property stolen from the Colony, and further protect traders and Christian missionaries residing with their leave in Kafirland. The new system worked well under the immediate and active superintendence of its organiser, whose firm and determined character was as familiar to the Kafir as to the colonist, and to both he sought to administer justice impartially. He had, however to contend with strong currents of prejudice and feeling aroused by the dislike of the colonists towards the Glenelg policy, and was retired from the service in 1839, when he was created a baronet and awarded a life pension.

In 1846, the young Gaika chief, Sandilli, attained manhood, and was surrounded by a war-party eager to test their strength against the Colony. A member of his tribe was being sent from Fort Beaufort to Graham's Town for trial on a charge of the theft of an ox, when he was rescued by some of his countrymen, and another prisoner to whom he was fastened was cruelly mutilated and killed. The surrender of those concerned in this outrage was refused, whereupon war was declared by the Governor, Sir P. Maitland. The military force advancing into Kafirland met with a reverse near Burnshill, having to retire and leave in possession of the Kafirs a lengthy wagon train, containing the baggage of the 7th Dragoon Guards. Martial law was proclaimed; burgher forces from all parts of the colony were summoned into the field, with Sir Andries Stockenstrom at their head; and hostilities were prosecuted until the close of 1848, when the Gaikas surrendered their arms, and the principals in the outrage near Fort Beaufort were given up. In 1851 the Kafirs resumed hostilities, attacking a column of troops in the Boomah Pass, and massacring the residents of the military villages in the Chumie basin. The insurgents were joined by the Gcaleka's portion of the Tembus, and a number of rebellious Hottentots, who all continued a harassing guerilla warfare until 1853, when it was brought to an end by Sir G. Cathcart. British sovereignty was at this time extended to the Kei River, and Kaffraria, with King William's Town as its centre, was proclaimed a British dependency, governed by British functionaries.

These long-continued Kafir wars contributed to give the Cape a bad name, causing it to be regarded as an undesirable place for settlement, and subjecting the colonists to the groundless and

unjust imputation that they were enriching themselves by the military expenditure incurred at the expense of the Imperial Government. These disturbances and hostilities were really ruinous to all classes of the inhabitants, and retarded the advance and development of the country itself.

The colonists had not, at this period, any voice in the management of public affairs. The Legislative Council was a nominee body, its constitution being based upon the principle of representation by nomination of the Crown. Petitions for an elected House of Representatives had been presented to the Secretary of State as early as 1827; and applications for the privilege of representation by the people were renewed



ANTI-CONVICT MEETING ON THE PARADE, CAPE TOWN.

at various periods after that, until, in 1849, an intimation was received that the Home Government was favourably disposed to entertain the matter. An event then occurred which brought the Colony into some prominence, and obtained for it the respect if not the approval of every other colony of the British Crown.

The Secretary of State, Earl Grey, proposed to turn the Cape into a penal settlement, and directed three hundred convicts, some of whom were Irish political offenders, to be removed from Bermuda to Cape Town. As soon as this became known, memorials and petitions from all parts of the country, remonstrating and protesting against the action, poured in upon the Governor. The Colony from its first settlement was free from the taint of con-

victimism, and the people were indignant at the idea of their country being degraded and their character tarnished by its conversion into a penal station. They also reasonably dreaded the evils which might ensue if felons and bush-rangers once got intermixed with the uncivilised natives along the borders. When the ship *Neptune*, freighted with the convicts, arrived in Simon's Bay, the spirit of the colonists was fairly aroused. Meetings were held in the open air; petitions to the Queen, to the two Houses of Parliament, and to the people of England were adopted; and the community entered into a solemn pledge to suspend all business transactions with the Government until the order making the Cape a penal station was reversed, and the convict ship was sent away. This method of "passive resistance"—more recently known as "boycotting"—was soon put into operation, and the Government found nearly all its ordinary channels of supply stopped. The struggle was prolonged for fully six months; but the determined stand made by the colonists was successful.



MR. J. FAIRBAIRN.

Earl Grey confessed that he had committed an error; and in February, 1850, an Order in Council was issued revoking the former one by which the Cape was named as a penal settlement, and the ship *Neptune* with the convicts sailed out of Simon's Bay for Van Diemen's Land. Among the men who took a prominent part in this struggle was Mr. John Fairbairn, President of the Anti-Convict Association. A quarter of a century previously he had fought the battle for the freedom of the

press with Lord C. Somerset, and as a journalist, from 1824 to 1860, his enlightened writings exercised a great educating and elevating influence upon the Cape and its people.

The satisfactory issue of the anti-convict contest stimulated the desire of the colonists for Representative Government, and Mr. Fairbairn and Sir A. Stockenström were deputed to proceed to England to vindicate the rights and interests of the colonists before the British Parliament and people. In 1853, a Constitution was granted, vesting the legislative power in the Governor and an elective Council and Assembly. The first Parliament met, and was formally opened by Lieut.-Governor Darling in

Cape Town on the 1st July, 1854, and Sir C. J. Brand, who was at the head of his profession at the Cape bar, and had been returned as a member, was chosen as the first Speaker of the House of Assembly.

In the same year, Sir George Grey was appointed Governor and High Commissioner. He had previously administered the affairs of South Australia and New Zealand, and evinced marked ability in his dealings with the aboriginal inhabitants of the latter place. He initiated a new and able policy for the peace of the Cape frontier. Hitherto, the Kafir races had been left entirely under the government of their own chiefs, and subject to their own barbarous customs. The chiefs, although within British possessions, were exercising independent power and jurisdictions, levying fees and fines, of which they appropriated a considerable part—especially in cases of the so-called offence of witchcraft, where the convicted one was put to torture and death, and his property confiscated. To remedy this state of things, Sir George Grey availed himself of the impecuniosity and greed of the Kafir. He made a rough calculation of the fines received by the chiefs, and offered them a monthly stipend, to be paid by Government on condition of their relinquishing their authority. The offer was accepted, and the worst part of Kafir policy was thus broken down. By the new arrangement, no more cruelties under the guise of suppressing witchcraft were permitted. All fees and fines for public offences became a part of the revenue of the Crown. The chiefs were still nominally to sit and hear cases, but they were guided and controlled by European magistrates, who administered a system of law based on equity and good conscience in the first instance, but intended to merge by degrees into the law of England, modified to suit the population. By this means the nucleus of a machinery was provided which has since been successfully extended for the control and government of the several native tribes throughout Kafirland.

At the outset, this plan required a considerable expenditure, but Sir George Grey was successful in securing an annual vote of £40,000 from the Imperial Government, and when he asked the Cape Parliament for its co-operation, it responded with an annual vote of £50,000 for organising and equipping a police force for the protection and security of the frontier. A further develop-



SIR C. J. BRAND.

ment of the policy was improving the tenure on which natives held their land, by substituting individual for tribal title, and thus giving them a vested interest in the soil. The country was at the same time opened up by the construction of roads, on which the natives were employed, thus acquiring habits of labour. Industrial schools, hospitals, and other Christian agencies were also at work to promote civilisation amongst the people.

Some of the Kafir chiefs, conscious of the new policy causing a decadence of their power, devised a plot to overthrow it. Under the influence of Kreli, a witch-doctor named Umlakazi, through



GCALKA CHIEF, KRELI.

the medium of his niece, Non-gase, prophesied an approaching resurrection from the dead of all the old chiefs and their followers, who would unite with the tribes to drive the white men and the Fingoes out of the country, and restore the glory of the Amakosa nation. In order that this should be accomplished, it was necessary that all Kafirs should destroy their cattle and their corn. Under the influence of this delusion, a vast number of the people sacrificed their whole means of subsistence,

and when the appointed day of resurrection arrived, and the predictions were unfulfilled, they were perfectly destitute and prepared to commit any outrage. The Governor had been calmly awaiting the development of the plot, and when the crisis was reached he was prepared to suppress any outbreak, and to render every charitable assistance possible to the foolish people who had committed this act of national self-destruction. He at once provided employment for portions of the natives upon public works, and distributed others in small numbers as labourers among the farmers throughout the country. At this time about 30,000 Kafirs entered the Colony and obtained work. About 20,000 were believed to have died from sickness and starvation; and at least 150,000 head of cattle were destroyed.

One result of this depopulation of the country was that large tracts in British Kaffraria were cleared of their former occupants. The Governor filled up some portions with European farmers from the Colony, on a system of military tenure. The Anglo-German Legion, disbanded after the close of the Crimean War,

were also introduced and located there—the Colony contributing towards the expense of bringing them out. And shortly afterwards a body of agricultural labourers from North Germany were introduced and settled in the neighbourhood of the military villages along the Buffalo River.

While these matters of frontier policy more immediately occupied Sir George Grey's attention, he was not neglectful of other interests affecting the welfare and prosperity of the Colony generally. The first railway line was commenced; telegraphs were introduced; and the Crown lands were surveyed and thrown open for public competition. Facilities for education were extended; lighthouses were erected on the seaboard; harbours were opened and improved; and a breakwater and docks constructed in Table Bay. Public aid was given for the encouragement of immigration, and regular mail communication was established with Great Britain. The sagacity, decision, and tact which Sir George Grey showed in his public administration raised him in the estimation not only of the colonists, but of the communities beyond the borders. He had far-sighted perceptions of the possible expansions of colonisation in South Africa, and was the first to give form and expression to the idea of a union of all its colonies and states. But the Home Government disapproved of his action in this matter; they were not prepared to depart from the policy of limiting British sovereignty to the Cape and Natal, and recalled him. A change of Ministry, however, occurred at home, and he was re-instated, and resumed office for another year, when his services were required by the Crown to settle grave native difficulties which had arisen in New Zealand. At this time, the youthful Prince Alfred (now H.R.H. the Duke of Edinburgh) first visited the Cape, and accompanied by Sir G. Grey made an extensive tour through South Africa, receiving everywhere a thoroughly joyous and loyal reception.



SIR GEORGE GREY.

Sir P. E. Wodehouse succeeded to the Governorship in 1862. An Imperial policy of economy in all expenditure upon the Colonies was then being adopted, and he was instructed to use all means to make British Kaffraria self-supporting, or to incorporate

it with the Cape. The Kaffrarians, however, resisted annexation, as they wished to retain their separate government, and the colonists opposed it, from an apprehension that they would be burdened with the expense of the military defence of the frontier, of which they could see no limit. The Governor suggested to the Secretary of State that if it was desired to unite the two colonies,



MR. SAUL SOLOMON.

it had better be done by an Act of the Imperial Parliament. This suggestion was adopted, and an annexing Bill was introduced into the House of Commons and became law—but it contained a provision that the Cape Parliament might, if so disposed, pass another enactment arranging details, before it came into operation. This was felt to be a straining of the constitution, if not a violation of the privileges of Parliament, and Mr. Saul Solomon, the senior member for Cape Town—who was fearless in his advocacy of the rights of the colony, and of fairness and justice for all classes of its inhabitants—brought

forward a series of resolutions which were passed by the House of Assembly, protesting against the action of the Government, and censuring the Governor for having suggested Imperial legislation without giving any intimation to colonists that such a grave step was in contemplation. But the Imperial Act being held *in terrorem*, the Legislature accepted the position, and in 1865 agreed to a Bill incorporating British Kaffraria with the colony, and increasing the number of constituencies entitled to representation in the Assembly, as well as enlarging the Legislative Council.

In the same year, Mr. William Porter, who had been Attorney-General of the Colony for over a quarter of a century, retired from office, receiving the unanimous thanks of both Houses of the Legislature for his public services. His distinguished attainments, high



MR. W. PORTER.

character, and large-heartedness gained for him the admiration and attachment of colonists of all classes.

The country now entered upon a brief period of adversity. Abnormal seasons, and protracted droughts had occasioned great loss of sheep and cattle; the wine farms were devastated with *oidium*; and the wine trade itself was depressed, as Mr. Gladstone's alcoholic scale of duty almost excluded it from the English market. Added to this, a war on the border, between the Orange Free State and the Basuto tribe, disastrously affected colonial business. But just at the time when the prospects of the country were most gloomy, a change in its fortunes occurred. In 1869, the Diamond Fields near the Vaal River unexpectedly unfolded their hidden wealth, and in a short time afterwards the success of the diamond mining industry, combined with a return of favourable seasons, restored prosperity all over South Africa.

The unhappy period of depression, however, brought to an issue an important question, which had been a matter of controversy in the Cape Colony for some time. By the Constitution granted in 1853, the Parliament was composed of representatives elected by the people, while the members of the Executive who held seats in both Chambers were appointed by and responsible to the Imperial Government. This caused a want of harmony between the Executive and the Legislature. During 1867 and 1869, when the finances declined, the Government submitted a scheme of taxation to equalise revenue and expenditure. The House of Assembly resolved that instead of taxation there should be retrenchment of expenditure. Matters threatened to come to a deadlock. Sir P. Wodehouse dissolved Parliament and, with the approval of the Home Government, appealed to the country—the issue being whether the Legislature should be modified so as to consist of a single Chamber of 36 members, giving the Executive increased powers, or whether the Colony should have the Administration conducted, as in England, by a Cabinet possessing the confidence of the Legislature. When the new Parliament met, it at once rejected the reactionary proposal of the Governor, and his period of services being completed, he retired.

Governor Sir Henry Barkly, experienced in the working of Constitutional Government in Australia, was then sent out, with authority to press the adoption of full self-government upon the Colony. He submitted a measure introducing the principle of responsible government, by qualifying persons holding certain executive offices to be eligible as members of the Legislature, and providing pensions for the existing executive officers in the event of their retirement on political grounds. This was passed

by both Houses, and the new Constitution was assented to by the Queen, and proclaimed on the 29th November, 1872, the first Ministry being formed by Sir John Charles Molteno, who at once inaugurated a vigorous policy for the development of the resources



SIR J. C. MOLTENO.

of the country, obtaining Parliamentary sanction for the construction of eight hundred miles of railway, to open communication from the seaports to the inland districts.

While the Colony, in the full enjoyment of self-government, was being borne along on a progressive wave of prosperity, affairs in the adjacent settlements were getting into a labyrinth of complications. The proclamation of British sovereignty over the Diamond Fields and the territory claimed by the chief Waterboer, in 1871, created a quarrel with the Orange Free State, who resented the act as a violation

of the Bloemfontein Convention of 1854. The South African Republic also contended that it was an infringement of their rights to lands north of the Vaal River. In this case arbitration was mutually agreed upon and resorted to, but when the award was given by the umpire—Lieut.-Governor Keate—it was repudiated by the Volksraad of the Republic. Natal and other portions of South Africa were at the same time protesting against the indiscriminate manner in which the Government of Griqualand West were permitting natives working at the diamond mines to obtain and carry away fire-arms. All these questions were being raised and agitated in 1874—and added to this was the trouble of the Langalibalele disturbance in Natal—when Lord Carnarvon took office as Secretary of State for the Colonies. He thought that Confederation, such as he had assisted in bringing into operation in the Canadian Dominion, might open a way for the settlement of matters. He proposed a conference of the Colonies and States, with a view to discuss native policy and other South African affairs; and without any previous consultation with the Cape Ministry, sent out his despatches to be published, nominating the members of the Conference, and appointing Mr. J. A. Froude, the historian, as his representative. The Cape Government, however, at once declined to further the proposal, objecting to the unconstitutional and sudden manner in which the question of Confederation was introduced, and maintaining that any movement

in its favour should be left to emanate from the expressed desire of the people themselves.

In the spring of 1876, the Volksraad of the South African Republic declared war upon a Bechuana tribe known as the Baputi, under the chief Secocoeni, occupying the mountain country adjoining Leydenburg. They had refused to pay hut-tax to the Government and molested the farmers living near them. A large commando, consisting of burghers and native allies, marched against them, but the attempt to dislodge the chief and his people from their stronghold was a failure. The High Commissioner, Sir H. Barkly, represented that these hostilities threatened the peace of the whole country; that the natives were everywhere excited and assuming an emboldened and unsatisfactory attitude. There was believed to be an understanding, if not an alliance between Secocoeni and the Zulu King Cetwyayo, and the Governor of Natal was apprehensive that the tranquillity of that colony might be seriously affected. The Imperial authorities thought, from the accounts which reached them, that there was an inflammable atmosphere in South Africa, in which the fire of war, if once kindled, might rapidly spread, and the safety of every community throughout it be imperilled. They were urged from various quarters to interpose, and even a cry came across from a section of the inhabitants of the South African Republic pressing the necessity of immediate action. Lord Carnarvon resolved to send out Sir Theophilus Shepstone, as special commissioner, armed with a commission that if the emergency were such as to render it necessary, he was, with the approval of the High Commissioner, Sir H. Barkly, to annex such territory as he might deem fit as a portion of the British dominions, and administer and control its affairs. At the same time, reinforcements of troops were sent out to strengthen the position in Natal.

Sir T. Shepstone, escorted by a handful of mounted policemen, arrived at Pretoria in the early part of 1877. He was well received by all parties, and the object of his mission was soon communicated to the Volksraad. The Government of the country was then in a weak condition; the President, Mr. Burgers, had from various causes become unpopular with the Dutch farmers, some of whom, with their families, were trekking away to the Interior. Taxes were in great part unpaid, the Treasury was well-nigh empty, and it had become almost impossible to carry on the Administration. The President submitted to the Volksraad, as an ultimatum, that the Government should be strengthened, or it must fall into the hands of England. Mr. P. Kruger, who was one of the members, disbelieved that the Queen's Government—which never allowed the independence of a native tribe to be

taken from it—would take away the independence of the Republic by force. He was hopeful that the State would extricate itself from its difficulties; but if that hope failed, then everything would fall into England's hands in an honourable way. The Volksraad refused to accept the President's proposals, and separated without doing anything. Sir T. Shepstone decided that the "emergency" contemplated by his Commission had arisen, and on the 12th April, 1877, proclaimed the Transvaal State to be British territory. The Executive and the President formally protested against the act, intimating that they would immediately send a deputation to England to defend the rights of the Republic, and endeavour to obtain a solution of the matter by peaceable means. During these extraordinary proceedings, while a country nearly as large as France was being seized and annexed by an unarmed British envoy, scarcely an angry word seems to have been said, and not a single disturbance occurred. The troops which soon after crossed the frontier of the State were as well received as the Queen's representative had been.



SIR H. B. E. FRERE.

Lord Carnarvon's faith in the policy of Confederation for South Africa was still strong; and looking about for a master-mind capable of forwarding it, he selected the tried and experienced Indian administrator Sir Bartle Frere, as successor to Sir H. Barkly as Governor and High Commissioner in South Africa. He arrived at the Cape in April, 1877, and had not been four months there before war broke out in Kafirland. The Gcaleka chief Kreli attacked the Fingoes, carrying off their cattle, and coming into collision

with the Colonial Mounted Police Force, killed one officer and four men. The disturbance soon extended to the Gaika tribe

whose chief Sandilli, with portion of his followers, joined in hostilities against the Colony. After several months' fighting, the war was brought to a close by the dispersion of the Gcalekas, the death of the Gaika chief Sandilli, and the surrender or capture of others who had taken part in it. A difference arose between the Governor and his Ministers as to the conduct of operations for the suppression of the disturbance, and Sir J. C. Molteno and his colleagues were dismissed from office, and a new Ministry, under the Premiership of Sir J. Gordon Sprigg, succeeded them. When Parliament assembled, the Governor's action was challenged in the House of Assembly, but after a long debate a majority affirmed a motion submitted by the Ministry, that under all the circumstances of the case it was unavoidable.

A wave of excitement and hostility on the part of the natives to the white inhabitants extended at this time from Kafirland to Griqualand West, and along the course of the Orange River to the sea. Officials, like Mr. C. Brownlee, engaged in the administration of native affairs, reported that embassies from the Zulu King, Cetuywayo, were keeping up communications with the turbulent chiefs, and seemed to be the mainspring of their actions. The Zulus, as a nation, since the installation of Panda as king by the emigrant farmers, had been left to themselves in entire barbarism. Attention was called to their condition in 1861 by the occurrence of internal disturbances between Panda and his sons, when there were grave apprehensions of an invasion of Natal, and reinforcements were hurried up from the Cape to protect it. Sir G. Grey then pointed out the critical position of affairs, and urged that the system pursued in Kaffraria of placing British officers in the country, and establishing a system of civilised control, should be adopted. But nothing was done. On the death of Panda, in 1873, his son, Cetuywayo, succeeded to the kingship, and maintained in full force and vigour the military system peculiar to the Zulus. He had long-standing disputes with the Government of the South-African Republic with reference to disputed territory; and, when the Transvaal State was annexed by Sir T. Shepstone, the cause of difference was transferred to the British, for Zululand was now encompassed by British possessions. It was arranged that the matter should be settled by arbitration, the final award being with the High Commissioner, Sir Bartle Frere. Meanwhile the attitude of the Zulus was not reassuring. Attacks were being made on the occupants of the Transvaal territory north of the Pongola, where men were murdered, cattle seized as booty, and children carried off as captives. Two sons of a chief named Sirayo crossed the Tugela into Natal, and forcibly took thence two defenceless refugee women, whom they carried into Zulu

territory and there murdered them. Missionaries were forced by constant threats to leave the country, and matters were regarded as critical, for in the event of any collision the Zulu army were strong enough to sweep Natal from end to end. In September, 1878, Sir Bartle Frere arrived at Natal, and gave his decision in accordance with the report of the Commission on the boundary dispute. It was in favour of the Zulu claim. In communicating this to Cetwayo, he made a demand on him for the surrender of the men who had violated Transvaal and Natal territory, and required that he should disband his army, allow missionaries and converts to return to their stations, and receive a British Resident, with whose consent and that of his National Council he could alone make war. These stipulations were not complied with, and the High Commissioner handed over their enforcement to the Com-



CETWAYO.

mander of the Forces, Lord Chelmsford. An advance was made into Zululand. Unfortunately there was no efficient scouting, and the General was ignorant of the whereabouts of the Zulu army, although it was then near to him. Camp was formed at Isandhlwana, and at dawn on the 22nd January, 1879, the General, with the main body of the column, went out to look for the enemy while the remainder, consisting of 700 Europeans and 600 Natives, was left in camp under Col. Pulleine, of Her Majesty's

24th, who was afterwards joined by Col. Durnford, R.E. By noon, the same day, an impi of the Zulu army, numbering 14,000 men, advanced upon the camp in horse-shoe shape, and gradually enclosed and captured it. No attempt to form a square or "laager" for defence had been made, but the troops gallantly stood together until their last cartridge had been fired, when, attacked by overwhelming numbers, the end came. Only about forty Europeans escaped. A portion of the Zulu force, numbering 4000, then advanced to take possession of Rorke's Drift in Natal; but the heroic defence made by Lieuts. Chard and Bromhead, with a company of the 24th Regiment, behind an embankment of sacks of corn and biscuit boxes, was effectual in repulsing them. The Zulu loss at Isandhlwana was not less than 1000, and at Rorke's Drift 350 bodies were found around

the post. After Isandhlwana several other engagements, including the battle of Kambula, were fought, and eventually Lord Chelmsford, strengthened by reinforcements, marched into the heart of Zululand with a force of about 4000 men, and moving in hollow rectangular formation, met and defeated the Zulu army at Ulundi, on the 4th July, 1879. Soon afterwards Cetwayo was captured, and all the influential chiefs gave in their submission. The Zulu military power, which had long hung like a thunder-cloud over South-Eastern Africa, was thus broken, although at a great cost of life and treasure.

Sir Garnet, now Lord, Wolseley, who was appointed temporarily to the supreme civil and military command, arrived in Zululand immediately after the victory of Ulundi. All that remained for him to do was to make a political settlement of the country. He was urged by experienced Colonists to bring the Zulu people under civilised control, on the system introduced by Sir G. Grey, and so successfully worked in Kaffraria. But as his instructions from the Home Government were positive against annexing any part of Zululand, he decided to divide it into thirteen districts, each ruled by a chosen chief or kinglet, under conditions which provided against the revival of any military organisation, and mitigated many of their cruel laws. He, however, warned the Secretary of State that there would be no permanent peace if Cetwayo were permitted to visit the theatre of his former power. Through the instrumentality of well-meaning but misguided sympathisers of the ex-king, who was a captive in the Castle, Cape Town, he was taken to England, where it was decided by the Liberal Government to restore him to part of his original territory. Within a week after his restoration in the commencement of 1883, disorder manifested itself. The tribes in Zululand arrayed themselves into two parties, one forming the Usutus, or the King's party, the other supporting the Hlubi chief, Usibepu, one of the thirteen kinglets. The latter formed an alliance with Omahu, a brother of Cetwayo, and their combined forces fell upon the Usutus, destroying six thousand of them, and this was followed up by Usibepu's followers holding a sanguinary carnival in Cetwayo's territory; killing all the king's people, regardless of age or sex. The king for a time took refuge in the "bush," but ultimately surrendered to the British Resident at Ekowe, and the question of what should be done with him was solved by his sudden death in February, 1884.

The British Government during these inter-tribal disturbances declared that it had no responsibility in Zululand beyond the Reserve, and declined to interfere in any way. After this declaration, the farmers on the Transvaal border, who were affected by the

continual strife, resolved without further delay to try and settle matters themselves. They installed Dinizulu, son of Cetywayo, King of Zululand, and made an agreement with the Usutus, that in return for their successful services, they would receive a cession of land, sufficient to establish an independent State, which would maintain peace in the country. About one hundred of them then accompanied Dinizulu and the Usutus against Usibepu, whom they defeated, and peace being thus restored they formed the New Republic, with Vryheid as its centre, which has since been joined to and incorporated into the South-African Republic. The remainder of Zululand was, in 1887, taken over as British territory, under the direct control of the Governor of Natal, and a Commissioner and magistrates, with a police force put in charge of the native population, now numbering over 140,000. Twelve months later, Dinizulu and some of the chiefs created disturbances, for which they were brought to trial, and being found guilty, were sentenced to imprisonment, and deported to St. Helena, where they at present remain.

When Lord Wolseley superseded Sir Bartle Frere as High Commissioner of South-east Africa, it was expected that the latter would resign his other offices; but such a course did not appear to him to be patriotic or loyal in the crisis of affairs in South Africa. After his return to Cape Town, the Ministry of Sir Gordon Sprigg submitted to Parliament proposals for a South-African conference or confederation, which the Home Government had pressed should be brought forward. No time could have been more inappropriate for its consideration. Delegates from the Transvaal were in the Colony, enlisting the sympathies of the people in the endeavour to obtain redress of their wrongs. Lord Wolseley's settlement of Zululand was universally condemned as pregnant with trouble. There was no assurance that border disturbances were at an end; and there was no desire on the part of the Cape colonists to interfere in extra-colonial affairs, the consequence of which might be a responsibility for Imperial blunders. The Legislature declined to proceed with the proposals by adopting the parliamentary form of avoiding a vote—"the previous question." The policy which Sir Bartle Frere had been specially chosen to advance and complete was thus indefinitely postponed, and it was intimated to him by Lord Kimberley that he would be replaced by another Governor. On his departure, it was felt throughout South Africa, that a man animated by a more sincere desire to promote the interests of the country, had never served the Queen.

The Cape Ministry had at this time a serious difficulty to deal with. After the close of the war of 1877, a peace preservation

law was passed, restricting the possession and carrying of arms by natives, so as to prevent the recurrence of disturbances. It was first applied to the Kafirs and Fingoes on the frontier, and afterwards extended to the Basutos. But its application in Basutoland was resisted, and in September 1880 nearly the whole tribe was in revolt. Immediately afterwards there was a rising of the Basutos in East Griqualand, followed by that of the Pondomise, Amaquati, and some of the other tribes east of the Drakensberg. It was an attempted native combination to kill all the magistrates, and get rid of the Government. One of the chiefs, Umhlonhlo, who is still a fugitive in Basutoland, murdered his magistrate, Mr. Hamilton Hope, in a most treacherous manner. The chief volunteered to go with Mr. Hope to aid the Government; but while on the way, his clansmen, the Pondomise, forming a semi-circle, began a war dance, the warriors making, as is the custom, feints at stabbing, when they suddenly rushed at Mr. Hope and two of his companions, Warrene and Henman, killing them on the spot. In a comparatively short time volunteer corps and auxiliary forces, together with burghers, even from the remote west, were sent to the front, and the outbreak in Kafirland was suppressed. Afterwards strenuous but unsuccessful efforts were made to reduce the Basutos to submission by force of arms. There then arose a strong colonial feeling in favour of the abandonment of the territory; but, in view of the disastrous effect this action might have, the British Government, in 1883, undertook the administration of the country.

Meanwhile other troubles were accumulating across the Vaal River. The act of the annexation of the Transvaal State in 1887 had been ratified by Lord Carnarvon on behalf of the Crown. It was believed by him to be generally acceptable, partly because there was no demonstration against it, beyond what was considered a merely formal, half-hearted protest on the part of the Executive Government, and partly because it was supported by addresses from some of the residents in the towns, expressing satisfaction with it. The mission of the first delegates to England, with the object of annulling the annexation, was therefore a failure. Lord Carnarvon informed them that the annexation could not be questioned, and refused to submit the question to a popular vote or "plebiscite." A second deputation, in 1878, consisting of Messrs. P. Kruger and P. J. Joubert, carrying a memorial from 6000 inhabitants against the annexation, was equally unsuccessful. Sir Michael Hicks-Beach, then Secretary of State, informed them that the Act of Sir T. Shepstone could not be rescinded, and intimated in his place in Parliament that the determination to reverse the line of policy adopted in 1852, when British

authority was withdrawn to the Orange River, had been the deliberate resolve of the Government. Deeply grieved and disappointed the delegates returned, resolved in their own minds that, failing redress, there was no alternative but a resort to arms for the re-establishment of their independence. Sir Donald Currie, whose friendly services had brought about a settlement of the dispute with the Orange Free State, and with whom the delegates had discussed the situation, realised the serious state of affairs, and addressed the Government, suggesting steps which might avoid trouble and bloodshed, but his overtures in the interests of peace and goodwill were declined.

In the Transvaal matters were allowed to drift. The administration, for two or three years after the annexation, continued to be a temporary and provisional one. Promises had been made to the people that a representative assembly or Volksraad would be given them, through which they would have a share in the government of the country. These promises were not fulfilled. Sir T. Shepstone urged that they should be, but no agreement could be come to as to the definite provisions of the constitution to be established. After the Zulu war, Lord Wolseley, with a large military force, entered the country and, assisted by Swazi allies, successfully stormed the stronghold of the chief Secocoeni, in order to give peace to the north-east of the Transvaal and restore the prestige of authority. Throughout this movement, as well as during the Zulu war, the Dutch section of the Transvaal inhabitants stood by in sullen inaction. They met in mass meetings, however, persistently protesting against the annexation, and evincing a dogged determination to accept nothing short of absolute independence. They were encouraged to hope for this by the Midlothian addresses of Mr. Gladstone, who strongly denounced the annexation as an unjust act of coercion of a free people; and when, shortly afterwards, Mr. Gladstone came into office as Premier, and it was announced that it was still intended to maintain the Queen's supremacy over the Transvaal, they were bitterly disappointed. Meanwhile, Sir T. Shepstone retired, and Sir W. Lanyon was appointed administrator. Lord Wolseley initiated a nominated legislature, and before leaving the country officially declared that British sovereignty would be maintained in the Transvaal as long as the sun shone or the rivers flowed to the sea. Under these circumstances the hostility to English domination increased. No taxes were paid except under protest. Plans were matured for a recourse to arms. The members of the old Volksraad, which had not met since 1877, were summoned to assemble on the 13th December, 1880, at Paardekraal, now known as Krugersdorp, on the high plateau of Witwatersrand. After

the formal opening proceedings, Messrs. Kruger, Joubert, and Pretorius were appointed as a Triumvirate to carry on the government under its republican constitution, and the burghers who had assembled in arms under their commandants undertook to fight in defence of that government to the death. Within little more than a week the seat of government, Pretoria, and all the towns garrisoned by English troops were invested by the Boer forces, and their communications cut off; while a detachment of the 94th regiment on its march from Leydenburg to Pretoria was attacked, and its commanding officer and fifty-five men killed, besides seven officers and ninety-one men wounded.

Sir George Colley, who was Governor of Natal and High Commissioner, on hearing of the rising, made immediate arrangements for relieving the besieged garrisons in the Transvaal. All the force he had available in Natal was little more than 1000 men and six guns, and with these he marched to the border. The Boer commandant, General Joubert, anticipated this movement, and at once crossed into Natal, occupying the strong position of Laing's Nek. When the English troops, on the 28th January, 1881, attempted to storm the pass they were met with a hail of bullets from the Boer sharpshooters and repulsed with heavy loss, including Colonel Deane, of her Majesty's 58th, and other officers who had led them. Another disaster was sustained at the Ingogo Heights, on the 7th February. Shortly afterwards General Sir Evelyn Wood arrived with reinforcements, and while these were being hurried up to effect a passage over the Nek, Sir G. Colley moved out of camp by night with about 400 men, and occupied Majuba Hill, overlooking the Boer position. As soon as their presence there was discovered on the 27th February, a portion of the Boer force scaled the mountain, and vindicated their courage and marksmanship by driving the troops off it in panic and flight. Sir George Colley, six officers, and ninety men were killed, and a still larger number wounded and captured, while the Boer loss was only one killed and five wounded. Commandant-General Joubert, in reporting the affair, ascribed their success to the help of the Almighty: "The troops fought like true heroes, but God gave us the victory."

Before this engagement, President Brand,* of the Orange Free State, was, in the interest of all South Africa, exercising his influence for peace, and the Home Government authorised Sir G. Colley to suspend hostilities if the Boers would desist from armed opposition, while a scheme was developed for granting them

* In 1882, President Brand was created by Her Majesty the Queen, an Honorary Knight Grand Cross of St. Michael and St. George.

autonomy. At this time the British force in Natal had been increased to 10,000 men of all arms and 10,000 more were on their way to South Africa, it being intended to place the supreme command in the hands of General Sir F. Roberts. Owing to the absence of the Triumvir Kruger at Rustenburg, there was a delay to the negotiations for peace; but an armistice was agreed upon, and subsequently a conference held between General Sir E. Wood (who succeeded Sir G. Colley) and the Boer leaders, which resulted in a settlement being come to, on the basis of the terms submitted by Lord Kimberley, Secretary of State, guaranteeing complete self-government to the people of the Transvaal, under their own Volksraad, subject to the suzerainty of the Queen and her successors. A Royal Commission, consisting of Sir E. Wood, Sir Henry de Villiers, and Sir Hercules Robinson, was appointed, who drafted a Convention, in terms of the conditions agreed to, which was ratified by the Volksraad of the Republic at Pretoria on the 25th October, 1881.

A modification of this Convention was negotiated in 1884. A deputation from the Volksraad of the Republic, consisting of Messrs. Kruger, Du Toit, and Smit, accompanied by Mr. Ewald Esselen, visited London, and after friendly discussion with the Earl of Derby, Secretary of State, it was mutually agreed that a new convention—now known as the London Convention—should be substituted for it. The suzerain rights were relinquished, and the British Government withdrew from all responsibility for the internal affairs of the State. By the provisions of this new Convention, however, it reserved the right of veto over any treaties the Republic may make with any state or nation, other than the Orange Free State. It also prescribed complete religious toleration, and stipulated that the native races should be allowed to acquire title to land under certain conditions, have access to the courts, and freedom to move about under a pass system, in accordance with the assurance given to them at Pretoria on the retrocession of the country.

The Convention further provided for the pacification of the territory on the south-west border of the Republic, which had been the subject of the Keate Award. A state of anarchy had arisen there. The Batlapin, Baralong, and Koranna chiefs were disputing with each other about territorial and sovereign rights. Mankoroane and Montsioa, whose status was recognised by the Keate Award, and who sought to come under British rule, were on one side, while Massouw and Moshette, who claimed to be subjects of the Republic, were on the other. After the retrocession of the Transvaal, the enmities of these chiefs broke out into hostilities, and each of the belligerents called in to their

assistance white volunteers or "freebooters," who were to receive land in the conquered district as a reward for their services. The allies of Massouw, on the lands thus acquired, formed a small republic which they named Stellaland, and those of Moshette one, called Goschen. To put an end to the intertribal disputes and control the freebooters, as well as to keep open a British trade route through these territories, the Convention of London provided for an extension of the south-western boundary of the Republic, so as to place Massouw and Moshette within its limits; and a British protectorate was established over Montsioa, Mankoroane, and the rest of the Bechuana tribe.

After the proclamation of the British Protectorate, a number of the Goschen freebooters, using the Transvaal territory as a base for their operations, continued their raids upon Montsioa, following them up with an attack on his town, Mafeking. Mr. Rhodes, representing the High Commissioner, witnessed these hostilities, and protested against them as a violation of the Queen's territory. After his departure, Montsioa was induced to call in Commandant Joubert, representing the South African Republic, as a mediator, and a few days afterwards a proclamation was issued by the President of the Republic assuming jurisdiction over Montsioa and his people.

The British Government called upon the South-African Republic to disavow this act as a violation of the Convention, and at the same time decided to send out a military force to expel the freebooters from Bechuanaland, and establish peace and order in the territory. The South-African Republic promptly withdrew the annexation proclamation, stating that it had only been issued for the establishment of peace on the border. The Cape Ministry of Sir T. Upington intervened, with a view to effecting a peaceful settlement, and paving the way for the annexation of the territory to the Colony; but the terms concluded by them were not acceptable to the High Commissioner, Sir H. Robinson, or the Imperial Government. Military preparations were then proceeded with, and a force of 4000 men, including 2000 irregular cavalry, under the immediate command of Sir C. Warren, R.E., entered the country without encountering any armed opposition, and peace and order were soon established.

In 1885, the British Protectorate was declared extended over Bechuanaland and the Kalihari, and the territory south of the Molopo River was created a Crown Colony, under the name of British Bechuanaland. In 1888, Matabeleland and Mashonaland was proclaimed as within the sphere of British influence, and in 1889 a Royal Charter was granted to the British South Africa Company, conferring powers of administration there. In May,

1891, an Order in Council was issued, authorising the High Commissioner, on Her Majesty's behalf, to exercise jurisdiction within all those central parts of South Africa under her protection, as bounded by British Bechuanaland, the German Protectorate, the Rivers Chobe and Zambesi, the Portuguese possessions, and the South-African Republic.



GOVERNMENT HOUSE, FROM THE OAK AVENUE, CAPE TOWN.

[To face page 203.]

CHAPTER VIII.

THE CAPE: ITS GOVERNMENT, INSTITUTIONS,
ROADS, RAILWAYS, AND HARBOURS.

THE Cape Colony has a Governor and a Parliament of two Houses—the Legislative Council and House of Assembly; and since 1872 it has enjoyed the political freedom of responsible or party government, carried on according to the usage prevailing in Great Britain. The Governor represents the Crown, and is advised and assisted in matters relating to the Colony by an Executive Council, who are responsible to Parliament for the advice they give. He can appoint or dismiss his ministers; but his ministers must always possess the confidence of the majority of the people's representatives. He is appointed by the Queen, but his salary is provided by the Colony. The salary as Governor and High Commissioner is £8,000 a year, with travelling allowances and free residences in town and country, and an allowance of £1,000 from Imperial funds. The Governor, as a branch of the Legislature, assents to, or withholds assent from, or reserves bills for the pleasure of Her Majesty. He can summon, prorogue, and dissolve the Parliament. In case of appropriation of public money, he must first recommend the House of Assembly to make provision accordingly, before any appropriation can become law. He can return bills to either House for specific amendment, after they have been passed by both Houses, and before they are assented to or reserved by him. Sir Henry Brougham Loch, K.C.M.G., K.C.B., is the present Governor, and as Her Majesty's High Commissioner he represents the authority of the Crown in Basutoland, Bechuanaland, Matabeleland, and other territories beyond



SIR H. B. LOCH,
GOVERNOR AND HIGH COMMISSIONER.

these limits in South Africa, as well as in the transaction of business with the Orange Free State and South-African Republics, Pondoland, Swaziland, and other native States.

While the gifts of Representative and Responsible Government have been granted to the Colony, the Crown has still the prerogative of appointing the Governor and of exercising a veto on legislation; it also remains the supreme fountain of justice, to which ultimate appeals from the Judicatures of the Colony are preferred; and the Imperial Parliament holds its indisputable omnipotence over this, as over every part of the whole Empire. The Crown, however, exercises no control over any public officer, except the Governor. The direction of all internal affairs, the management of departments, and the appointment to all public offices, rest with the ministers forming the Executive Council.

The Ministry or Cabinet, who, together with the Governor and Lieutenant-Governor, form the Executive Council, is at present composed of: *—

The Premier, who has no portfolio.

The Colonial Secretary, whose office supervises the Civil Service throughout the various divisions of the Colony, and controls the Post and Telegraph Departments, Deeds Registry, Defence, Education, Hospitals and Asylums.†

The Attorney-General, who is the law adviser and public prosecutor, and controls the Department of the Administration of Justice, the Convict Establishments and Police.

The Treasurer-General, who is the Receiver-General and Finance officer, and principal Collector and Controller of Customs and Excise, and is at present charged with the departments of Agriculture, Lands, Woods, Forests and Mines.

The Commissioner of Crown Lands and Public Works, charged with the administration and supervision of Railways and other Public Works, Lighthouses and Harbours.

The Secretary for Native Affairs, who is charged with the management of all the relations with the Aboriginal tribes.

The salaries of Ministers are fixed at £1,500 per annum, and with an additional £250 to the Prime Minister.

Frequent change of Ministries was a noticeable characteristic

* While these pages were in the press a change took place in the constitution of the Cape Ministry. Mr. Rhodes continues Prime Minister, without portfolio; and Mr. Faure became Colonial Secretary in place of Secretary for Native Affairs—the new Ministers being Sir Gordon Sprigg, Treasurer-General; Mr. Schreiner, Attorney-General; Mr. Laing, Commissioner of Crown Lands and Public Works; and Mr. Frost, Secretary for Native Affairs.

† The Government is represented in England at 112, Victoria Street, London, by the Agent-General for the Colony, Sir Charles Mills, K.C.M.G., C.B., who has discharged the duties of the office with distinction since 1882.

of the Australian Legislatures, after they first entered upon their career of self-government, and it was prophesied that the same liability to frequent political crises would be experienced at the Cape. But, owing to the strong conservatism which dominates the people as a whole, the prediction has not been fulfilled. There have been only six Ministries in office since 1872. The following is a list of them :—

MOLTENO MINISTRY.

From December, 1872, to February, 1878.

Premier and Colonial Secretary ..	J. C. Molteno, M.L.A.
Treasurer of the Colony	H. White, M.L.C.
Attorneys-General	{ J. H. de Villiers, M.L.A. S. Jacobs, M.L.A.
	{ A. Stockenström, M.L.A.
Commissioners of Crown Lands	{ C. A. Smith, M.L.A.
and Public Works	{ J. X. Merriman, M.L.A.
Secretary for Native Affairs ..	C. Brownlee, M.L.A.

SPRIGG MINISTRY.

From February, 1878, to May, 1881.

Premier and Colonial Secretary ..	J. Gordon Sprigg, M.L.A.
Treasurers of the Colony	{ J. Miller, M.L.C. H. W. Pearson, M.L.A.
Attorneys-General	{ Thos. Upington, M.L.A. J. W. Leonard, M.L.A.
Commissioner of Crown Lands and Public Works	J. Laing, M.L.A.
Secretary for Native Affairs ..	W. Ayliff, M.L.A.

SCANLEN MINISTRY.

From May, 1881, to May, 1884.

Premier, Attorney-General, and Colonial Secretary	T. C. Scanlen, M.L.A.
Colonial Secretary	J. C. Molteno, M.L.A.
Treasurers of the Colony	{ C. W. Hutton, M.L.C. C. J. Rhodes, M.L.A.
Attorney-General	J. W. Leonard, M.L.A.
Commissioner of Crown Lands and Public Works	J. X. Merriman, M.L.A.
Secretary for Native Affairs ..	J. W. Sauer, M.L.A.
Minister without portfolio ..	J. H. Hofmeyr, M.L.A.

UPINGTON MINISTRY.

From May, 1884, to November, 1886.

Premier and Attorney-General ..	Thos. Upington, M.L.A.
Colonial Secretaries	{ J. Ayliff, M.L.A. (<i>dec.</i>) J. Tudhope, M.L.A.

UPINGTON MINISTRY (*continued*).

Treasurer of the Colony	J. Gordon Sprigg, M.L.A.
Commissioner of Crown Lands and Public Works	F. Schermbrucker, M.L.C.
Secretary for Native Affairs ..	J. A. de Wet, M.L.A.

SPRIGG MINISTRY (SECOND).

From November, 1886, to July, 1890.

Premier and Treasurer of the Colony	J. Gordon Sprigg, M.L.A.
Colonial Secretaries	{ J. Tudhope, M.L.A. H. W. Pearson, M.L.A.
Attorney-General	Thos. Upington, M.L.A.
Commissioner of Crown Lands and Public Works	F. Schermbrucker, M.L.A.
Secretary for Native Affairs ..	J. A. de Wet, M.L.A.

RHODES MINISTRY.

Premier (without portfolio) ..	Cecil J. Rhodes, M.L.A.
Colonial Secretary	J. W. Sauer, M.L.A.
Treasurer-General	J. X. Merriman, M.L.A.
Attorney-General	J. Rose Innes, M.L.A.
Secretary for Native Affairs ..	P. H. Faure, M.L.A.
Commissioners of Crown Lands and Public Works	{ Cecil J. Rhodes, M.L.A. J. Sivewright, M.L.A.

The Cape Parliament Houses form a handsome architectural pile in the centre of the city of Cape Town. They measure 264 feet in length, by 141 feet in breadth, with a height of 64 feet, and were erected and completed at a cost of £220,000. The approaches and basement, from the ground to the main floor, are executed in fine-grained colonial granite, and the remainder in red brick, relieved by groups of pilasters and window-dressings in Portland cement; the elevations being designed in the Renaissance style freely treated. There are two handsome porticos, one facing the Government Gardens, and another, Grave Street. The latter, which is the principal entrance, is of massive dimensions, supported by eight coupled columns, and approached by a commanding flight of granite steps. Passing through to the entrance hall, the visitor has to right and left of him the two debating chambers, one for the Legislative Council, and the other for the House of Assembly, each of which has a floor space of sixty-seven feet in length, by thirty-six feet in width—only ten feet less in length and width than the House of Commons at Westminster. Leading from the entrance hall is the central

lobby or vestibule, which is used as a Throne-room on the occasion of the opening or prorogation of Parliament. This is a lofty hall of stately appearance, its sides and ends being ornamented with marble columns and pilasters with foliated caps, supporting a gallery, which gives access to the public galleries of the two Chambers, where official, distinguished, and other visitors are accommodated. Adjoining is the Library and Conference Room—a very handsome apartment furnished in teak wood, with galleries reaching to the full height of the building, and bays filled with works of reference on political science and economy, and literature. Along the corridors which extend from each side



THE CAPE PARLIAMENT HOUSES.

of the central lobby are the offices of the several Parliamentary officials, and the reading, refreshment, smoking, and billiard rooms. On the second floor there are the different committee-rooms, retiring-rooms for the gentlemen of the Press and shorthand writers, and the Parliamentary kitchen and sculleries, with cuisine appliances not inferior to the Amphitryon for the comfort of members. The grounds surrounding the building on all sides are laid out with ornamental shrubs and bright parterres of Cape bulbs and flowers; and at the entrance facing Adderley Street, is a marble statue of Her Majesty the Queen, by Mr. Brock, raised by public subscriptions of the citizens of Cape Town during the Jubilee year.

The Parliament must meet once in every year, and oftener if necessary. Its sessions are usually held during the months from April to August. The rules of procedure are substantially the same as those adopted by the British Parliament, and the usages of the House of Commons are observed in the House of Assembly, so far as they are applicable. The journals, entries, and proceedings are made and recorded in the English language; but since 1882, debates and discussions may be conducted either in English or Dutch, but in no other language. Members are paid an allowance for attendance upon their Parliamentary duties over a term not exceeding ninety days in any year; members who reside within ten miles of Cape Town receiving one guinea per day, and country members receiving £1 16s. per day, for the time they are away from their homes.

The Legislative Council consists of twenty-two members, over thirty-one years of age, and elected by popular vote, the same as members of the House of Assembly. A property qualification is required of them—namely, the possession of immovable property to the amount of £2,000, or of movable and immovable property to the value of £4,000. For the election of members of the Council, the Colony was formerly divided into two constituencies or provinces (West and East); but, by Acts passed in 1874 and 1877, it has been divided into eight electoral circles or provinces, seven of which return three members, and the other (Griqualand West) one. The Chief Justice is *ex-officio* President of the Council, and the members are designated "Honourable" during their term of office.

The House of Assembly numbers seventy-six members, elected to serve for five years, unless Parliament is sooner dissolved. Any qualified voter may be elected for the Assembly, with the exception of paid officials, other than Cabinet Ministers. The Speaker of the House is chosen from among its members, and the present occupant of the chair (Sir David Tennant, Kt., K.C.M.G.) has held office for a longer period than any Speaker in the Empire, having been successively elected since June, 1874.

The franchise which obtains in the Colony is a liberal one. The qualification required of voters (irrespective of race or colour) is being a born or naturalized British subject, resident in the Colony for twelve months prior to registration, and either an occupier or joint occupier of property, whose share is of the value of £75, or in receipt of salary of not less than £50 per annum; but no persons are entitled to be registered on account of sharing in any native communal or tribal occupation of lands, nor unless they are able to sign their names and write their occupations and address. Previous to August, 1892, the property qualification for

parliamentary voters was £25, and all who were on the roll of voters in any fiscal division of the Colony at that time are still qualified to be registered so long as they continue to reside in the same division. Bribery and corrupt practices at elections are forbidden under severe penalties; and petitions challenging the election of members are brought for hearing before the Supreme Court.

From and after the 1st July, 1894, the voting will be by ballot at all elections for the Legislative Council and House of Assembly.

The law of the Colony consists of the Roman-Dutch Law, modified by the customs and laws of Holland, by placats and proclamations up to 1824, and after that by the Ordinances of Council and of the Legislative Council, and by the Acts of the Colonial Parliament. There is also a large body of statute law, scattered throughout the Imperial statute book, which has force within it. Where no provision is made by the Roman-Dutch law, or local statute, the law of England prevails.

The highest Court of Judicature is the "Supreme Court," which has its sittings in Cape Town. It is composed of the Chief Justice and eight puisne judges. Three of the judges form the Court of the Eastern Districts, sitting at Graham's Town; three form the High Court of Griqualand, sitting at Kimberley; and the Court in Cape Town has the Chief Justice and the two senior puisne judges. Circuit Courts are periodically held in the country towns. There is a Court of Appeal for hearing any appeals from the High Courts or Circuit Courts, and there is a Vice-admiralty Court, both of which have their sittings in Cape Town. Besides these higher courts, there are Courts of Resident Magistrates held in each town or division of the Colony; also Periodical Courts, held in outlying villages; and Courts of special paid Justices of the Peace, who have jurisdiction within certain limits. Justices of the Peace are appointed by the Governor and subject to pleasure; they keep the public peace, summon offenders and witnesses, arrest criminals, and take examinations; they likewise take recognizances of men to be on their good behaviour, and attest declarations.

Field-cornets are also appointed by the Governor; and are bound to apprehend without warrant and to commit to prison any person who in their presence commits, or whom they have reasonable grounds to suspect of having committed, any crime. They conform to the special instructions of the Resident Magistrate within whose jurisdiction their ward is situated. In cases of wreck, when their wards adjoin the sea, they are bound to repair to the spot where the wreck occurs, and to use every endeavour

to save life and property. The Commissioners of Police and members of the constabulary of a district are empowered to arrest persons for any crime or offence, and they are required to suppress all tumults and other breaches of the peace. The Colonial police force numbers about 900 officers and men.

Among the institutions of the Colony, there is one, connected with the transfer of land, which was established at a very early date by the Dutch East India Company, and is deserving of particular notice. It is the Government Department known as the "Deeds Registry Office," which secures in a very simple yet perfect manner the registration of all titles to landed property and mortgages upon the same. The registry extends back to the period shortly after the Cape was first occupied by Europeans; and at any moment the purchaser of an estate may refer to and ascertain all the by-gone circumstances, servitudes, encumbrances, and other matters connected with any old property, without the troublesome complexity or expense which attends the same proceeding in England. Titles to land are in the first instance issued by Government, representing the Crown, and registry of such issue is preserved in the Surveyor-General's Office. All subsequent conveyance, transfer, or exchange of any property is required to be recorded at the "Deeds Registry Office," where regular entry is made of the description of the property, its extent, the name of the seller, the purchaser, and the amount for which it is sold. A duty of 4 per cent. on the purchase amount is paid to the colonial revenue on the sale of any property, and also a succession duty on properties bequeathed; and certificates of these having been paid are required to be produced before transfer is given. The "Deeds Office" likewise provides for the registration of hypothecations and mortgages. To have any legal right or title, or to be effectual against creditors, all such bonds are entered in what is termed the "debt registry," which is indexed, and daily open to public inspection on payment of a small fee. No transfer of land can be obtained until after a settlement of these bonds, either by repayment, or by the mortgagee consenting to continue his loan on the securities of the new purchaser, or by the mortgagee consenting to transfer of the land. Under this system the most perfect security is given to the capitalist, and the conveyance of landed property is speedily, simply, and economically effected. The Department also provides for a registry of joint stock companies with limited liability, and of all rights secured under the Copyright Act and the Trades Marks Act.

The "Master's Office" is another very important department, charged with the performance of duties corresponding to those of a Master of Chancery and a Commissioner of Insolvent Estates

combined. It rests with the Master to register wills, to control the proceedings of trustees or executors in the administration of estates, and properties of minors, lunatics, and absent persons. He also regulates all proceedings in bankruptcy, and assists the Supreme Court in matters which it refers to him for report or opinion. The duties connected with the administration of minors' and absent persons' estates are of a specially responsible character.

The inheritance of minors who have no tutors appointed by their parents, and the moneys in the hands of tutors-dative and curators-dative, after payment of the debts due by the estate and the amount required for the immediate maintenance of the person under their guardianship, must be paid into the hands of the Master. The moneys thus paid into his office for account of minors, lunatics, and unknown and foreign heirs having no legal representatives in the Colony, forms what is denominated the "Guardian's Fund." The capital of this Fund amounts at present to about £665,000, and is invested partly in mortgage bonds under security of landed property, and partly in Government stock and debentures. The yearly interest at present allowed on minors' inheritances is at the rate of four per cent. This ceases on their attaining their majority. Foreign heirs not having legal representatives in the Colony, are allowed one-half of the legal rate current in the Colony, and for a period not exceeding five years. Their names and residences, where known, and the amounts due to them, are published twice a year, namely in July and in October, in the *Government Gazette*, also in the *London Gazette*, and other papers.

The Government is represented in each division or district by a Civil Commissioner or a Magistrate; in some cases the two offices being combined in one person. The civil commissioners are charged with the collection of all revenues as well as the administration of justice and other matters. In colonial terms, a "division" means the territory over which the authority of a civil commissioner extends; a "district," the territory in which a resident magistrate has jurisdiction.

In all the divisions there are local bodies termed Divisional Councils, elected by the ratepayers. To them is entrusted the repair and maintenance of roads and bridges, the control of outspans and pounds, the extirpation of noxious plants and destruction of wild animals, and the settlement of questions relating to land boundaries; and they have also to inspect and report upon Crown waste lands proposed to be offered for sale. In most of the towns there are Municipal Councils, elected by the householders, for the management of local affairs. These Divisional Councils and Municipalities are empowered to raise

revenues for their respective purposes, by the levy of rates upon landed properties, by tolls, and by licences. There are also Village Management Boards, Boards of Health, Licensing Boards, and Harbour Boards. The receipts and payments of Divisional Councils in 1892 amounted to £144,286 and £144,353 respectively; and of Municipalities to £490,375 and £468,892. The value of fixed property as assessed for rateable purposes in the various divisions of the Colony (exclusive of the territories of Transkei, Tembuland and Griqualand East) amounted in 1892 to £36,813,622.

Education is supported by a system of state "grants-in-aid" encouraging voluntary efforts on the part of local bodies and school managers. The main objects to which grants are appropriated are:—(1) In aid of the expenses of the Cape of Good Hope University and bursaries; (2) In aid of the salaries of professors and lecturers in colleges training for the University course, and of teachers in the several undenominational public schools, district boarding schools, mission schools, aborigines' day-schools, native industrial schools, as well as schools of art and elementary teachers; (3) Capitation allowances towards private farm schools, circuit teachers' schools, boarding schools, and indigent children in these schools in the country districts, as well as to native boys and girls receiving training in industrial institutions; (4) In aid of school buildings, the equipping of schools, and good service allowance to teachers. The public money is only appropriated for secular instruction; religious instruction is left in the hands of the local managers, care being taken that all religious convictions are duly respected. By these means the education of all classes, without distinction of creed or colour, is sought to be promoted. Attention is given to the instruction of native lads in trades, such as carpentry, wagon-making, printing and bookbinding, &c., and to the training of native girls for domestic employments, and provision is also made for the superior instruction of those who aspire to professional pursuits. The public schools lead up to the colleges, in which the course of study is regulated by the requirements for degrees in the University of the Cape of Good Hope, which is an examining body forming the keystone of the system of Public Education. The University was created in 1873, and by Royal Charter issued in 1877 the degrees conferred by it are entitled to the same rank and precedence and consideration as if granted by any University in the United Kingdom.

According to the returns published in January, 1893, the number of state-aided schools, exclusive of colleges, is 1641, the number of scholars on the books 83,347, and the ordinary daily

attendance 62,023. Besides these institutions, there are unaided schools, such as Girls' High Schools, Convent Schools, Church Grammar Schools, and many other private establishments, of which no returns are rendered.

The Government expenditure in the Department of Public Education for educational services during the year ended in June, 1892, amounted to £133,930, including administration. The Department is directed by the Superintendent-General of Education, who is responsible for the administration of the grants in accordance with the School Regulations which have been assented to by both Houses of Parliament by resolution. A regular inspection of all schools is maintained through a staff of Deputy Inspectors.

The defence of the Colony is provided for by a permanent force, the Cape Mounted Riflemen (with which is incorporated the Field Artillery), numbering a total of 824 officers and men. The volunteers and cadet corps—artillery, cavalry, engineers, and rifles—have over 5,400 men enrolled. There is also an auxiliary force of burghers and levies, comprising every able-bodied man between 18 and 50 years of age (with certain exceptions), and in case of a call for active service the first drafts are taken from those between the ages of 18 and 30.

Recently, new works for the defence of Table Bay, Simon's Bay, and the Cape Peninsula have been constructed, under the supervision of the Imperial military authorities; the Colonial Government supplying all the necessary materials and labour, and the Imperial Government furnishing the designs and providing the technical fittings and armament of 2-inch 9·2-ton breech-loading guns, having a range of 10,000 yards.

From the time when the Colony became a British possession, contributions towards the support of the clergy of various denominations were granted by the Government. In 1853 these amounted to £16,060 per annum; and by a schedule to the Constitution Ordinance that sum was set aside to be annually appropriated for the service of "religious worship." But the unequal distribution of this amount among the different churches, and the growing claims of new congregations excluded from a share in it, as well as the persistent agitation of Mr. Saul Solomon and other advocates of the "Voluntary Principle," finally induced the Legislature in 1875 to pass an Act providing for its gradual withdrawal and abolition. This Act secured the continuance of stipends during the life-time of the existing incumbents, and to the successors of such of them as might die or resign before the expiration of five years from the taking effect of the Act. The annual vote now is reduced to £7,000, and

will gradually altogether disappear. There will then be no State-supported churches.

Public Libraries, Museums, Botanic Gardens, and an Association for the Promotion of the Fine Arts, have been established and supported by the public, and partly by the State. One of the best things the Colony has to boast



THE PUBLIC LIBRARY.

of is the handsome building in Cape Town containing at present under one roof the South African Library and Museum. The Library Hall is a fine room about eighty feet long by forty feet broad, well lighted and fitted with galleries and recesses, which are lined with bookshelves and books. It contains upwards of 47,000 volumes in every department of literature and science, besides the valuable collection presented by Sir George Grey, consisting of rare manuscripts, original editions of early printed works, and many volumes illustrative of the native languages of Africa, Australia, and New Zealand. It is open and available for study daily to all classes of the community; while subscribers of from £1 to £3 per annum may take out one or more sets of books and

periodicals for perusal at their homes. The other wing of the building, now occupied as the South African Museum, will soon be available for the treasures of the library, and an amount of £2,000 has been voluntarily subscribed by the Cape Town public for suitably fitting up the additional accommodation thus provided.

The country libraries are seventy in number, the most noticeable being that of Port Elizabeth, which contains 20,166 volumes; one at Graham's Town, containing 10,000 volumes; one at King William's Town, with 13,000 volumes; one at Graaff-Reinet, with 5,820 volumes; one at Lovedale, with 6,438 volumes; and one at East London, with 4,421 volumes.

The South African Museum is stored with an extensive and valuable collection of specimens illustrative of the natural history of the country, and of other parts of the world. The zoological division includes some well-mounted examples secured for the

institution by Mr. F. C. Selous. In the entomological portion there is a very complete collection of the butterflies, largely contributed to by Col. J. H. Bowker, of Natal. The geological series embraces specimens of the fossil fauna and flora of the continent, including a complete mounted cast of the great fossil reptile recently exhumed by Professor Seely in the Karroo. There is also a good collection of native implements and weapons, as well as some unique specimens of the carved figures found amongst the ruins of Zimbabwe, in Mashonaland. The limited space within the present museum has prevented the display of numerous interesting objects which are in the hands of the curator; but provision has now been made for a new building, which will give the necessary accommodation. A suitable site has been selected in the Government gardens, and designs for the building adopted, so that the work will be at once proceeded with, the estimated cost being £20,000. In the Albany Museum at Graham's Town, and at Port Elizabeth, there are also very interesting collections of the fauna, mineral, and other productions of South Africa.

The Royal Observatory, under charge of Her Majesty's astronomer, Dr. David Gill, is near to Cape Town. In addition to the daily astronomical observations carried on at this institution, a photographic survey has been made of the southern hemisphere, for the purpose of forming a catalogue of the stars, in connection with the work prosecuted by the committee of the Paris Astro-photographic Congress of 1887.

Journalism has made great advances in the Colony and throughout South Africa generally. The periodical publications issued over the country, from the Cape to Mashonaland, number about 130. In the leading cities and towns, the English papers are published morning and evening, with daily cable information from Europe. The literary ability displayed in their columns would do no discredit to some of the best journals in the world. The Dutch newspapers are usually in bi-lingual form, and have a considerable circulation among the rural population. One newspaper is published in the Kafir language, conducted by an educated native, who gives expression to the ideas of his fellow-countrymen on matters more especially concerning them. An excellent English Cape Illustrated Magazine and a Dutch 'Tydschrift,' serve to bring into focus the best contributions of literary and scientific workers in the country.

The public charities of the Cape are manifold. There are no poor laws, and there is no regular pauper class, such as is found in European countries. There is, however, as in every populous country there must be, a good deal of sickness and distress, of which intemperance is largely the cause. But benevolence is

widely exercised; the whole community, when appealed to, subscribes readily and largely to all kinds of charities.

The Lunatic Asylums and Hospitals are wholly, or in part, supported by grants from the revenue, and are under the inspection and control of Government officials. There are commodious public hospitals at Cape Town, Port Elizabeth, Graham's Town, Graaff-Reinet, King William's Town, East London, Queen's Town, Kimberley, and Barkly West, as well as cottage hospitals at Wynberg, Woodstock, Butterworth, and Umtata. There are Lunatic Asylums at Graham's Town, Port Alfred, Valkenberg, near Cape Town, and at Robben Island. At the latter place there is also a General Infirmary for chronic sick, and a well-arranged and comfortable institution for the segregation of lepers, gathered from all parts of South Africa. In Cape Town there is a convenient and cheap abode for seamen at the Sailors' Home. Orphanages, and other benevolent societies under the care of local philanthropic bodies, are all voluntarily supported. Masonic lodges and Good Templar Lodges are numerous all over the Colony.

The thrift and providence of the people is indicated by the operations of the Colonial Savings Banks. In 1884 the total amount deposited in these banks was £473,032. On the 30th June, 1892, the amount was £1,307,179, showing an increase of £834,146. Of the total balance in 1892, the sum of £1,183,375 was held by the Post Office savings banks. Building Societies, and Oddfellows and other Friendly Societies are also established in the various towns.

Young South Africa is devoted to out-of-door amusements, recreations, and sports. Cricket and football are as popular here as in England; and contests with the Mother Country teams attract thousands of eager spectators. The coloured, as well as the white races have taken to both games, and the Malays occasionally have their grand tournaments. Lawn tennis, golf and cycling are also popular, and regattas are regularly held in Table Bay, at Port Elizabeth, and at East London. Race meetings take place at most of the centres; those at Kimberley, Port Elizabeth, Cape Town and Johannesburg are generally the most attractive.

The progress of the Colony is nowhere more apparent than in the improvements which have taken place in the means of travelling from the sea-board to the inland districts. In a country such as the Cape, with no rivers available for internal navigation, its material advancement was heavily handicapped until roads were made, mountain barriers opened up, and rivers bridged. Lord Charles Somerset was the first to commence the opening of the mountain passes by constructing a road over the French

Hoek; and about ten years later Sir Lowry Cole authorised the line of road across the Hottentots Holland Mountain, which still bears his name. In 1844, however, a system of public road-making was initiated by Mr. John Montagu, Colonial Secretary, which conferred most extensive benefits upon the community. He devised the construction of main lines of communication throughout the Colony, together with the advantageous employment of colonial convict labour upon them; and, aided by a public board of administration (the Central Road Board), and the professional services of Colonel Michell and Mr. A. G. Bain, as engineers, he was successful in carrying out to completion undertakings which Governor Sir Harry Smith said "would do honour to a great nation instead of a mere dependency of the British Crown." The first of these works carried through was that over Cradock's Kloof, which was formerly a mere track over a rugged rocky ledge, with a steep precipice on one side of the mountain between George and Langekloof; and to cross over it with wagons was an undertaking of extreme peril. A beautiful and easy ascent of the mountain was substituted, now known as Montagu Pass. Numbers of similar mountain passes have since been constructed, the most notable amongst them being Bain's Pass, the Katberg, the Zuurberg, and the Zwarteberg Pass.



THE OLD CRADOCK'S KLOOF.

The constructed main roads throughout the Colony extend over 4,200 miles, and the divisional roads are more than double that length.

There has been a very large expenditure on bridges; and there are now comparatively few of the rivers on the main highways of traffic from the Cape Peninsula to the borders of Natal which have not been spanned by strong and handsome structures. One of the most recently completed works of this nature is the Gouritz River Bridge, designed on the cantilever principle, like the Forth Bridge, by Sir S. Baker. The Gouritz River, which drains the Great Karroo, flows to the sea between Riversdale and Mossel

Bay in a deep channel; and after thunderstorms in the back-country it has been known to rise twenty or thirty feet in a few hours, rushing along with great velocity, and sweeping off every obstruction in its way. The new bridge across it has a length of 702 feet. Its particular feature is the large central span of 420 feet, with two side spans of 140 feet each, and the carriage way elevated 210 feet above the bed of the river. It is built of steel, and is a model of light construction, but designed to support enormous weight, being adapted for railway as well as ordinary traffic purposes. The cost of it was £60,000, and the builders were Messrs. Hangside & Co., of London.

But among the undertakings which, more especially of late years, have marked the enterprising spirit of the Colony, has been the energetic expansion of its railway systems. The first railway was projected during the governorship of Sir George Grey, who turned the first sod of the Cape Town and Wellington line on the 31st March, 1859. This line, 58 miles in length, was constructed by an English company under a guarantee of a rate of interest of 6 per cent. per annum on a sum of £500,000. In 1862 private Colonial enterprise started a short branch line, from Salt River to Wynberg, without any guarantee or subsidy; and later on another line from Port Elizabeth to Uitenhage was commenced by a private company. All these lines, however, afterwards passed by purchase into the hands of the Government. In 1874, consequent upon the general prosperity resulting from the discovery and development of the diamond-mines in Griqualand West, legislative authority was given for carrying on railway construction upon a large scale from the three principal seaports of the Colony, Cape Town, Port Elizabeth, and East London. Subsequently these works were authorised to be extended inland, forming three main systems, converging towards Kimberley and the Orange Free State, and afterwards junction lines were formed connecting them with one another.

With the advance of the railway to Kimberley, in 1885, attention began to be directed to the importance of the trade with the interior. An open route to the north was secured to the Colony by the establishment of a British Protectorate in Bechuanaland, and a few years later the railway was carried on to Vryburg. In 1887 the development of the Witwatersrand gold-fields, and the rapid increase of population there, presented a boundless prospect to commercial enterprise. The seaports of the Cape and Natal were keen competitors for the business and traffic thus created, and rival customs tariffs and rebate regulations on the "beggar my neighbour" system were for a time brought into active play. To remedy this, it was proposed that there should be a Customs

Union of the various colonies and states, agreeing to a uniform tariff of duties to be levied at all the seaports, in the proceeds of which the inland states and maritime colonies would each have an equitable share, leaving trade free to flow through its natural channels by the shortest and cheapest routes.

At the instance of the Cape Government, a Customs Conference was convened in Cape Town in 1888, and representatives of the Cape, Natal, and the Orange Free State, met to discuss and consider the practicability of such a scheme. The result was the adoption of a Customs Union on the basis of free trade in respect of all South African products within the Union, and a uniform tariff on all goods imported—the maritime states handing over to the inland states three-fourths of the duties collected on the goods consumed by the latter, and retaining one-fourth for transit, harbour, and other charges; and goods for consumption in states or territories outside the Union to be passed through duty free, or under rebatement, at such rates as the revenue interests of the forwarding states demand. This Union was ratified by the Legislatures of the Cape and Orange Free State, and fixed to continue in force until June 1894. Bechuanaland and Basutoland have since been admitted into it, and it is probable that ere long Natal and the South African Republic will see their way to join it, and give practical effect to the idea of unity of interests which is pervading the minds of the people of the several colonies and states.

The Orange Free State Government, having thus been placed in receipt of a share of customs duties estimated to yield an addition to its revenue of £100,000 per annum, at once resolved upon railway extension within its own border, in junction with the colonial lines; and, after negotiations, an arrangement was come to, in terms of a convention, by which the Cape Government undertook to construct and work a through line from the Orange River to the Vaal River, connecting with the Witwatersrand gold-fields, until such time as the State is prepared to acquire the line by purchase. This Convention established the principle in South Africa of the government of a maritime colony undertaking the construction and working of a railway in territory beyond its political jurisdiction. It was followed up by an agreement being concluded between the Cape Government and the Netherlands South African Railway Company, under sanction and guarantee of the South African Republic, for the speedy completion of the railway from the northern banks of the Vaal River to Johannesburg and Pretoria, running powers and through traffic arrangements over these lines (89 miles in length) being granted to the Cape administration until December, 1894, in return for an advance of funds at a fair rate of interest.

To those who, like ourselves, remember South Africa when there was not a single mile of railway in the country, the change which has come over the scene in respect of the means of travelling long distances is very remarkable. Places so widely separated from the metropolis that it took weeks together to reach them are now within a couple of days' journey. A daily service of trains conveys one from Cape Town to the Kimberley diamond-fields in thirty-five hours, and to the Johannesburg gold-fields in fifty-seven hours, while from the coast ports of Port Elizabeth and East London the journey to the latter place is accomplished in forty-five hours. The weekly mail trains, provided with comfortable sleeping and dining cars, lavatory, and electric light, speed along at an accelerated rate, performing the journey in five or six hours less. They leave Johannesburg on Mondays, and arrive in Cape Town at 1 p.m. on Wednesday, in time to transfer passengers and mails to the homeward-bound steamer on the same day. The whole distance of 7,000 miles from the Rand to London, or from London to the Rand, may now, by means of the fast mail boats and the railway, be traversed in seventeen or eighteen and a half days.

At the beginning of 1893 the total length of Government railways open for traffic in the Cape Colony, Bechuanaland, and the Orange Free State, was 2,253 miles. These were purchased, constructed, and completed at a cost of £8,580 per mile. The contribution from receipts or earnings towards the payment of interest on capital during the year 1892, was £4 14s. 8d. per cent. This is irrespective of all the advantages to the people from the facilities of travel and interchange of commodities, as well as the reduction in carriage as compared with former charges, which has effected an immense saving to the country.

The following is an enumeration of the several main and connecting lines:—

WESTERN AND INTERIOR SYSTEM.

	Miles.	Total mileage.
Cape Town, <i>via</i> Kimberley to Border of Bechuanaland	705½	
Border of Bechuanaland to Vryburg	68½	
Stellenbosch Branch	26	
Malmesbury „	29½	
Salt River to Simon's Town	20	
Eerste River to Sir Lowry's Pass	14½	
	<hr/>	864

RAILWAYS.

221

MIDLAND SYSTEM.

	Miles.	Total Mileage
Port Elizabeth to Orange River Bridge, Norval's Pont	328	
Colesberg Junction to Colesberg	2½	
Naauppoort „ „ De Aar	69	
Zwartkops „ „ Graaff-Reinet	178	
Alicedale „ „ Grahamstown	3½	
	<hr/>	612

EASTERN SYSTEM.

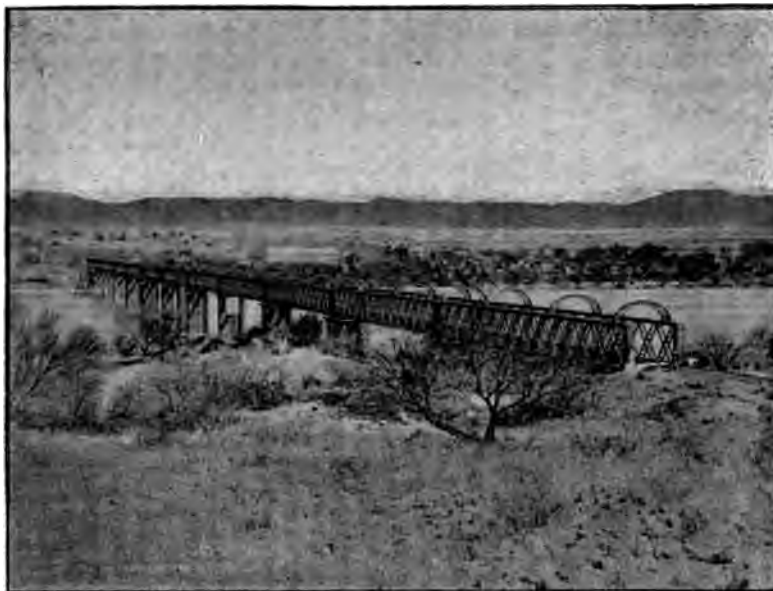
East London to Aliwal North	280	
Albert Junction to Orange River, Bethulie	39	
Stormberg „ „ Middelburg Road	85	
Blaney „ „ King William's Town	10	
East London to Buffalo Harbour Wharf	1½	
	<hr/>	415½

NORTHERN SYSTEM.

Orange River Bridge, Norval's Pont to Bloemfontein	122½	
„ „ „ Bethulie to Springfontein	28	
Bloemfontein to Vaal River, Viljoens Drift	211	
	<hr/>	361½
Total		<hr/> 2253

These railways have been carried out on the 3 ft. 6 in. gauge, and with the exception of the Cape Town and Wynberg line, and the first seven miles of the Port Elizabeth and Uitenhage line, are all single lines. The general direction of the Western and Northern systems is north-east, crossing the rivers forming the main drainage of the country, and intervening ridges, and the bridges are consequently both numerous and important. The Midland system runs north, following chiefly the main drainage of the country; while the principal characteristic of the Eastern system is its severe gradients. Owing to the nature of the country traversed, there is a large amount of water-way to be provided for, and the bridges, culverts, and openings on the several lines number 8,590. The bridges spanning the Orange River at various points are magnificent and substantial specimens of engineering work. The Good Hope Bridge, on the Kimberley extension, has a length of 1,230 feet, in nine spans of 130 feet each, plus the extra width of the piers. The Bethulie Bridge has

a length of 1,486 feet. But the largest is that at Norval's Pont, which has thirteen spans of 130 feet, and cost £76,593. Over the



BRIDGE OVER ORANGE RIVER AT NORVAL'S PONT.



ENTRANCE TO HEX RIVER VALLEY.

Vaal River at Fourteen Streams there is also a bridge of ten spans of 133 feet each.

The chief physical obstacle in carrying the iron-road into the interior was presented by the barrier range of mountains forming the edge of the Karroo Plateau. But engineering skill soon surmounted the difficulty. An entrance was secured by the Hex River Valley, near to Worcester, and through its portals of perpendicular rock the line gradually ascends to Hex River East, where it begins to climb the mountains by sweeping curves and zigzags along their sides, piercing some of the edges and spurs by tunnels, and crossing gaps and gullies spanned by light viaducts, until within a distance of thirty-six miles from Worcester it attains an altitude of 3,193 feet at the Triangle. As the traveller in the railway is sped along towards the summit of the range, he catches frequent glimpses of the beautiful valley which opens out below, dotted with farms and vineyards and corn-lands, and surrounded with ridge after ridge of mountain peaks, some 6,000 feet high, usually, capped with snow in the winter season. For upwards of twenty miles of this picturesque ascent, the gradients are 1 in 40 and 1 in 45, with curves of five chains radius, and there are some extensive rock cuttings and precipitous embankments. The highest point on the line, however, is at Pieter Meintjes Fontein, 77 miles from Worcester, where a height of 3,588 feet is attained—a little higher than the summit of Table Mountain. There is no stopping-place at this point, but soon afterwards the picturesquely bright and well-equipped refreshment-station of Matjesfontein is reached at an elevation of 2,970 feet. Matjesfontein furnishes an object-lesson of what may be accomplished on the bare uninviting plains of the Karroo. Before the advent of the railway, there was not a vestige of life on the spot; now it is a centre of production and trade, developed by the enterprise and industry of one individual, and the villa residences built around the station are the resort of many who enjoy a change from the coast-lands to the invigorating air of the plateau. Thence, all through the Karroo Plains to Kimberley and Vryburg, the line runs on comparatively level ground. The highest point (5,185 feet) on the Midland system is at Carlton, near Naauwport,



SNOW-CAPPED PEAKS (6,000 FEET).

164 miles from Port Elizabeth, whence the country is generally flat to De Aar, the junction with the Western system, at 339 miles from Port Elizabeth, and 500 miles from Cape Town. The Eastern system attains its summit (5,586 feet) on the top of the Stormberg Range, 207 miles from the coast at East London. And on the Northern system the elevated plains of the Orange Free State rise to 4,891 feet at Heilbron, and the highest altitude 5,600 feet, is attained at Johannesburg.

At Salt River, near Cape Town, at Uitenhage, near Port Elizabeth, and at East London, railway workshops have been esta-



MATJESFONTEIN.

blished, where repairs and transformations of locomotives, rolling stock and coaching required for the different lines are executed departmentally. The working rolling stock has lately been largely increased, and now consists of 372 locomotives, 458 carriages, 4729 trucks, and 384 other vehicles.

South African coal is largely used as fuel on the Eastern and Northern systems of railways. Three of the coal-mines on the Stormberg Mountains are in close proximity to the eastern railway line, and each furnish monthly supplies at the rate of 20s. per ton. Their output in 1892 was as follows:—Cyphergat, 17,047 tons; Fairview, 11,000 tons; Molteno, 6,000 tons. The Indwe mine

which yields coal of superior quality, is some distance from the main line, but the construction of a branch line to the mine has been authorised. The northern line is supplied by the coal-mines of the Free State. The acreage of the Bedworth Colliery, at Viljoen's Drift, is estimated at 40 square miles, and coal seams have been struck at depths of 400 feet. The property is well developed and equipped, and has machinery capable of producing 1,000 tons per day. Adjacent to it is the Free State Colliery, also in proximity to the railway. Contracts have been made with these collieries to furnish extensive supplies monthly at 11s. per ton. During last year a trial of the various qualities of coal was made, with the result that the average consumption per train mile was as follows: Welsb coal (Ocean Merthyr), 30 lbs. per train mile; Dundee (Natal), 38 lbs.; Viljoen's Drift, 44 lbs.; Indwe, 48 lbs.; Cyphergat, 58 lbs.; Fairview, 58 lbs.; and Molteno, 64 lbs.

On the 31st December, 1892, the length of the Cape Government railway lines open was 2,253 miles. The earnings for the year per mile of line open were £1,035 18s. 4d. The train miles run 6,972,360 miles, the earnings per train mile 6s. 5d., and expenses 3s. 11d. The expenses per cent. of carriage earnings were 61·0 per cent.; the capital entitled to interest on open lines £18,557,593; net receipts per cent. of capital, £4 14s. 8d.; the cost of construction per mile, £8,580; the earnings, £2,248,980; expenditure, £1,370,904; the number of passengers carried, 4,771,635; and the tonnage of goods, 713,521.

Besides the Government lines, there are four others in the Colony constructed and owned by public companies. One is in the mining district of Namaqualand, laid down by the Cape Copper Mining Company, with a gauge of 2 feet 6 inches. It runs from Port Nolloth to Ookiep—a distance of 92 miles—and it is in contemplation to extend it towards the Orange River. Another is a line from Graham's Town to Port Alfred, over 43 miles, towards the construction of which the Government contributed a subsidy of £50,000. The principle of stimulating private enterprise was also adopted with regard to the Worcester and Montagu line, about 42 miles long, for which a subsidy of £75,000 was granted. The fourth line is the Suburban and Metropolitan Railway from Cape Town to Sea Point—a distance of over three miles. These latter lines are of the same gauge as the Government railways.

For the purpose of developing the coal-fields at the Indwe, in the Wodehouse district, a subsidy has been authorised to a Company for the construction of a railway connecting the Indwe with the Eastern railway. Authority has also been granted by Parlia-

ment for the construction of a railway from the mouth of St. John's River to Maclear, in Griqualand East, running in a convenient direction along the water-shed, and opening up a most important part of South Africa.

A very efficient postal system exists in the Colony and throughout South Africa. The main work of organisation has been carried out by the Cape Postal Department, whose various offices and agencies number 718, and extend as far northward as Salisbury in Mashonaland. All the sea-borne mails to and from the inland States and Territories are also dealt with in the head-office at Cape Town. The increasing requirements of the service have led the Government to authorise the erection of a new General



NEW POST AND TELEGRAPH OFFICES.

Post Office, in the metropolis, where the postal and telegraph duties can be discharged more satisfactorily than with the present limited accommodation. The building has already been commenced upon the site of the old Commercial Exchange, on the Parade, and a contract concluded for carrying it on to the second story for a sum of about £80,000.

The total number of letters posted in 1892 (exclusive of official correspondence) was 13,456,160; of post-cards, 503,256; of newspapers, 6,731,040; of book and sample packets, 1,219,800; and of parcels, 335,062. The amount paid by Government for carriage of inland mails per annum is about £67,000; and the subsidy for the ocean and mail service is £88,000. The rate of letter postage

to all parts of the world, *viâ* the United Kingdom, is 2½*d.* per half ounce; and in all parts of the Cape Colony and Orange Free State, 1*d.* per half ounce; to Natal, Bechuanaland, and the South African Republic, 2*d.* per half ounce; and to Mashonaland 4*d.* per half ounce.

There is a weekly mail service to and from England by the magnificent steamers of the Castle and Union steamship companies. Under the new mail contract, which takes effect from October, 1893, and ends on the 30th September, 1900, the length of the voyage is reduced from 20 days, with 12 hours' grace, to 19 days with 6 hours' grace. The total subsidy paid by the Colony is £88,000 for the first year, and £1,000 per annum additional afterwards. By the Union Company's steamer *Scot*, the passage has been made in 14 days 6 hours, and by the Castle steamer *Dunottar* in 15 days 2 hours.

The telegraph lines now open in South Africa extend over 9,922 miles. Of these, 5,482 miles, with 13,767 miles of wire, and 310 offices, besides 307 miles of telephone and exchange wires, are under the administration of the Cape Colony; 566 miles, with 1,441 miles of wire, and 76 offices, under Natal; 159 miles, with 275 miles of wire, and 6 offices, under British Bechuanaland; 2 miles and 1 office, under Basutoland; 1,144 miles and 1,322 miles of wire, with 32 offices, under the Orange Free State; 1,650 miles, with 3,560 miles of wire and 41 offices, under the South African Republic; and 819 miles of line and wire, with 10 offices, under the British South Africa Company. In the Cape Colony the profit on working, including the value of Government telegrams, was £75,241 8*s.* 10*d.*, or £17 18*s.* 7*d.* per cent. on the value of total capital invested (£419,659 7*s.* 0*d.*), or £34 10*s.* 2*d.* per cent. on the amount of borrowed capital expended (£218,030 17*s.* 7*d.*). The present tariff is one shilling for ten words, and sixpence for every additional five. In the British South Africa Company's territory it is threepence a word, with a minimum charge of half-a-crown.

Cable communication with England is maintained by the East-ern and South African Telegraph Company, the Cape Colony contributing an annual subsidy of £15,000, and Natal £5,000.

Along the seaboard of the Colony there are several ports and harbours available to ocean commerce, and on some of them large amounts of public money have been spent to secure the safety and protection of shipping, and facilitate the discharging and loading of vessels. On the west coast, Walwich Bay, in Damaraland, and Port Nolloth, south of the Orange River, are the two ports frequented for trade purposes. Saldanha Bay is a splendid land-locked harbour, at present only used as a quarantine station.

The port of Cape Town, Table Bay, where the large mail-steamers arrive and depart on their outward and homeward voyages, has an anchorage sheltered by a breakwater 3,640 feet long, and offers to shipping the advantages of docks, quayage, storage, a graving-dock and patent slip, for overhauling or repair, and a plentiful supply of Table Mountain water. The docks were designed by the late Sir John Coode, and named after H.R.H. the Duke of Edinburgh, who, as Prince Alfred, tipped the first wagon-load of stone at the tail-end of the breakwater on the 17th July, 1860, and declared the inner basin open in 1870. The expanding



PRINCE ALFRED DOCKS, TABLE BAY.

trade of the port of late years has rendered necessary an increase of the dock accommodation, and an outer harbour of an area of 62 acres, which will have a minimum depth of 27 feet at low water, is now being carried out by the resident engineer, Mr. Thwaites, C.E., under the direction of the Table Bay Harbour Board. As portion of this plan, a south pier or mound has already been run out about 1,600 feet, and will be carried 120 feet further, parallel with the breakwater, so as to protect the basin from the south-east winds, and within the arm, quay walls and iron jetties are being constructed for vessels to lie alongside. The inner basin has a

depth of from 20 to 24 feet at low water, and is ten acres in extent. The graving-dock, which is built of Paarl granite, has received the larger class of vessels, such as H.M.S. *Raleigh* and the White Star Liners *Coptic* and *Ionic*. The docks are provided with steam shear-legs, capable of lifting up to 50 tons; and they are also in direct railway communication with the Colony generally.

Mossel Bay, situate midway between Table Bay and Algoa Bay, is from its geographical position the natural port for the central coast divisions of the Colony; there is a first-class lighthouse, an excellent harbour, warehouses, jetties and steam-cranes.



LANDING JETTY, PORT ELIZABETH.

Algoa Bay, on the shores of which the town of Port Elizabeth is spread, is an open but safe anchorage, and noted for the energetic and expeditious manner in which vessels are loaded and discharged by lighters and steam-tugs plying between the shipping and the landing-jetties. These jetties, two in number, are well equipped with steam-cranes and with rails, and the goods are discharged from the boats into railway trucks, for transmission up country, or transferred to the transit warehouses belonging to the Harbour Board, to be sorted and distributed by the landing companies. To meet the increasing requirements of trade, the existing accommodation and landing appliances are

being increased; the north jetty being lengthened by 240 feet, and widened by 24, making its dimensions 1,150 feet long by 84 feet wide, supplied with eight 2-ton and one 7-ton hydraulic cranes and capstans, to facilitate shunting. Plans for the construction of sheltering works have been proposed from time to time, one being the conversion of the Baaken's River valley into a dock; but for the present they are in abeyance. This is the chief port for the midland and eastern districts of the Colony and the interior, and it has conspicuously shared in the improvements and development which have of late marked the advance of the country. New Customs buildings have been



MAIN STREET, PORT ELIZABETH.

erected at the end of Jetty Street, and the railway station has been enlarged and improved to meet the increasing requirements of traffic. An admirably arranged theatre, with accommodation for 800 persons, has lately been completed. The other public buildings of the town, such as the Town Hall, the Produce Market, the banks and warehouses, the churches, the Volunteer Drill Hall, the Liedertafel, and the Club, are all among the finest structures of the kind to be found in the Colony.

East London, at the Buffalo River mouth, is a river harbour, where works have been in progress for some years, under the direction of Sir John Coode's firm. Like most South African

river, the Buffalo had a "bar" at its mouth; and to remove this, training walls were constructed in order to narrow the channel and increase the scour, and a breakwater run out in the form of an arm to prevent the sea checking the river's outflow and driving the sand back upon the bar. During the past two years, powerful Hopper barges and sand-pumps have been at work, with the result that the river channel has been cleared; and there is now a depth of 15 feet on the bar at low water tides, enabling vessels of large draught to enter and utilise the spacious water accommodation inside the river's mouth. During the year



BUFFALO RIVER, EAST LONDON.

the Clan and Bucknall steamers, and sailing-vessels visiting the port, have come inside and discharged at the wharf; in fact, all vessels except the deep-draughted steamers of the Union and Castle lines.

With the increased landing facilities at the port, and its connection by the Bethulie and Springfontein junction with the northern system of railway, the trade of East London has of late shown marked development, and the town itself is giving unmistakable evidence of prosperity in the enlargement of business, the building of new warehouses and private dwellings, and

mented with trellised vines. One of the ancient features has long since disappeared—the canals, with sluices, which ran down the central streets towards the Castle, carrying off the drainage from the mountain to the sea. These streets, the Heerengracht and Keizersgracht, were the residences of high functionaries and the best Cape families, who found amusement and recreation in unceremonial afternoon gatherings on the stoeps, and whose evening parties always separated when the Castle gun was fired at nine o'clock. Social life and customs have considerably altered since then ; even the nomenclature of the streets has undergone change



ADDERLEY STREET, CAPE TOWN.

—the old Heerengracht being named Adderley Street, in recognition of the services rendered to the Colony by a member of the House of Commons at the time of the Anti-Convict question ; and the Keizersgracht re-baptized Darling Street, in honour of the Lieutenant-Governor who opened the first Parliament.

The central thoroughfares have been so transformed of late years as to be almost unrecognisable by persons familiar with their olden appearance. In Adderley Street especially, the work of reconstruction has been most marked. The unpretentious buildings of the former inhabitants have given place to modern

edifices, and decorated exteriors, in imitation of the best style of European street architecture. The African Banking Corporation, the Colonial Mutual Buildings, with its clock-tower, drapers, clothiers, jewellers, chemists, booksellers, shipping and assurance offices, and other business establishments are well represented on one side of the street, while on the other are ranged the Harbour Board Offices, the Railway Terminus, the imposing Standard Bank buildings, the Dutch Reformed Church, and the Public Offices, with the Parliament Houses beyond. The old Commercial Exchange has been razed to the ground, and will shortly be replaced by an extensive block intended to accommodate the Postal and Telegraph Department—a building of stately proportions, designed by Mr. H. S. Greaves—which is to be faced with colonial cut stone from the marine beds at Saldanha Bay. In



NEW THEATRE, DARLING STREET.

close proximity on the Parade, facing Darling Street, the new theatre has been completed, from a design by Mr. Alexander, providing a suitable home for the drama and opera in the metropolis, with accommodation for an audience of 1,500 persons. Other structures are in progress, some, like Messrs. Garlick and Co.'s, raising their summits to the sky, and one now being erected by the Commercial Assurance Company, extending from Adderley Street to St. George's Street, with a four-storied frontage to Strand Street, intended for a grand hotel.

St. George's Street, running parallel to Adderley Street, is another broad central thoroughfare, with modern buildings, which it is intended further to improve by opening up and continuing it through Strand Street to the margin of the Bay. The St. George's Cathedral, with its classic Grecian front and memorial

cross to the memory of Bishop Gray, stands at its upper end, and next to it, on the right, are the offices of the British South Africa Chartered Company, the offices of the *Cape Times*—a close imitation in style of its prototype of Printing-House Square—and the verandah-shaded building which serves at present as the General Post Office. Further along the street is the St. George's Hotel, the offices of the *Argus* Publishing Company, the handsome edifice recently erected as the colonial headquarters of the Bank of Africa, and many large and substantial wholesale mercantile warehouses. In both these main thoroughfares, as well as in



ST. GEORGE'S STREET, CAPE TOWN.

those of Darling, Plein, and Strand Streets, there is plenty of bustle and activity, especially on the last day of the week, when they are crowded and animated.

Churches of various denominations attest to the religious characteristics of the people. None of the buildings, however, can lay claim to great architectural merit. One of the best is the St. Mary's Roman Catholic Cathedral, which, from its elevated site near to Government House, is a conspicuous object. Another is the Metropolitan Wesleyan Methodist Church, of Gothic style, whose graceful spire is a prominent feature in the city. The Dutch Reformed Church, in Adderley Street, with its vane-topped

Flemish spire, is noticeable for its lack of any external embellishment; but its interior is remarkable for its immense span of roof (80 feet wide) unsupported by prop or pillar, and also for its wood-carved pulpit—the work of a German artist named Arneith. The Congregational, Scotch Presbyterian, Lutheran, Baptist, Moravian, Free Protestant, Seventh Day Adventists, and the Jewish Synagogue, are among the other churches of the town. The Cape General Mission and the Salvation Army have their halls and offices. The Young Men's Christian Association has an excellent Institution, providing both scientific and literary entertainments, as well as recreation for the youth of the city. Two handsome structures, the gift of wealthy lady members of the Dutch Reformed Church, have been completed and opened for mission and school work in the neighbourhood of the crowded native quarters; and a fine range of buildings, for the St. George's Home and Schools, is in course of erection on the slopes above the city, near the Kloof Road.

Government House, the official residence of Her Majesty's representative in the Colony, is pleasantly embowered under the shade of the trees of the Government Gardens, in the central portion of the city. It is a very unpretentious building, and in no respect can be regarded as a palatial dwelling. Some of the rooms are spacious and comfortable, yet they are scarcely on a fitting scale when vice-regal pageants have to be gone through. The House has two entrances—the ordinary public one at the top of Grave Street, and the other from the oak avenue in the Government Gardens.

These gardens form one of the most pleasant ornaments of Cape Town. They are a legacy from the olden time, for which the community may thank the Dutch East India Company. Originally planted more for use than adornment—to shelter the vegetables and fruits grown for the refreshment of passing fleets—they now afford a grateful shade and pleasant place of resort to the inhabitants, and are especially appreciated by strangers and visitors. The central walk extends for nearly three-quarters of a mile through an avenue of old oaks, with the grounds of Government House on one side, and the Botanic Gardens on the other. The latter, now under the care of the Town Council, are laid out with grass plots, shrubberies, and conservatories, and contain a variety of trees and plants, embracing rare exotic, as well as indigenous productions. Here the oak, maple, lime, elm, and pine grow contiguous to the graceful deodar of the Himalayas, the camphor tree of Sumatra, the lofty blue-gums of Australia, and the towering and stately araucaria of Norfolk Island. English fruit-trees, laden with apple, pear or peach, stand side by

side with the orange, olive, and mulberry of the Mediterranean coast, or the banana, mango, and alligator pear of the West Indies. Azaleas, camellia japonicas, fuchsias, and rhododendrons bloom under the open sky as freely as roses, carnations, and violets, while around them are Cape wild flowers of great variety and beauty.

A marble statue of Sir George Grey, executed by the late Mr. Calder Marshall, stands in these gardens. It was erected by public subscription of the people, whose affection and confidence he gained during his rule over them. More than thirty years ago, it was a day-dream of his, that in this part of Table Valley there would be raised up halls of legislature, a public library, a museum, and university buildings; and as a proof of his faith in its future, he presented to the Colony his own rare collection of books—early printed English editions, valuable manuscripts of the tenth century, and vocabularies of native languages—which are treasured in the South African Public Library. The hopes and plans he foreshadowed for the Cape have since taken form and shape. The Parliament houses now ornament one side of the gardens, the Public Library the other. Adjoining them is the Fine Art Gallery in New Street. The South African Museum will be erected at the upper end of the Avenue in the course of the year; and in the adjacent South African College is the nucleus of the Teaching University, where the youth of South Africa may be equipped intellectually for the battle of life, acquiring knowledge which, as Sir George Grey said, “may enable them to bless and earn the blessings of nations yet to be born in the interior of this vast Continent.”

The city has its own municipal government; administered by a Mayor and Town Council. Its yearly revenue is now approaching £100,000, and its authorised municipal debt, chiefly in 5 and 4 per cent. debentures, is £222,275. Its Town Hall, in Green-market Square, is a flat, square, two-storeyed building, ornamented with a portico, and was erected during the Dutch *régime* more than a century ago. It will ere long be superseded by a suitable modern structure, with public assembly rooms, worthy of the metropolis. Of late the civic authorities have taken practical steps to remove the reproach of Cape Town being an undrained, unkempt, and uncleanly place, and are carrying out a number of improvements, which, together with its many natural advantages, its wealth of fine scenery, and its delightful climate, should make it one of the most attractive places of residence in the world. A comprehensive drainage, sewage, and irrigation scheme, devised by Mr. C. Dunscombe, M.I.C.E., has been approved of, and a public loan of £162,000 authorised to carry out the work. The

water supply, which is fairly abundant and constant, is at the same time to be increased by the construction of storage reservoirs on Table Mountain. The streets are at present lit by gas from the works of the Cape Town District Gaslight Company; but contracts have been entered into with Messrs. Siemens and Halske, of Berlin, for the lighting of the city by electricity, with water as the motive power. Meanwhile the Docks, and the Railway Station, the Somerset Hospital, the Parliament Houses, the Public Library, and several private establishments, have installations of the electric light. Fish, fruit, and vegetable markets are provided in different quarters, and are well supplied at all seasons; and there is also a market for the public sale of other produce, such as ostrich feathers and wool. The population within the municipal area is 52,000 persons, and the valuation of house property for taxation purposes is £3,676,200.

After Cape Town the most populous town in the Colony is Kimberley, which numbers 28,713 persons, and with the adjacent township of Beaconsfield, a total of over 39,000. Port Elizabeth comes next with a population of 23,266, and Grahamstown follows with a population of 10,498. The other chief towns are Paarl, with 7,668 persons; King William's Town, 7,226; East London, 6,924; Graaff-Reinet 5,946; Worcester, 5,404; Uitenhage, 5,331; Cradock, 4,389; Oudtshoorn, 4,386; Queenstown, 4,094; Stellenbosch, 3,462; Beaufort West, 2,791; Malmesbury, 2,461; Aliwal North, 2,057; and Swellendam, 1,727.

COMMERCE.

The commerce of the Colony for the last seven years has been steadily expanding and progressing, and in the year just concluded (1892) the volume of external trade reached a higher point than it has ever done before. The total of all imports and exports amounted to £21,465,308, nearly double what it was in 1886.

TOTAL IMPORTS AND EXPORTS.

In 1886	...	...	...	...	£10,924,617
„ 1887	...	...	...	...	12,895,109
„ 1888	...	...	...	...	14,554,994
„ 1889	...	...	...	...	17,715,147
„ 1890	...	...	...	...	19,204,242
„ 1891	...	...	...	...	19,688,997
„ 1892	...	...	...	...	21,465,308

£116,448,414

244 POPULATION, THE METROPOLIS, COMMERCE, FINANCE, ETC.

By far the greater part of this trade is with the United Kingdom and British Possessions, and of the minor proportion carried on with foreign countries the most is with the United States of America and Germany. The subjoined table shows the distribution of the trade operations, which contribute so much to the commerce of Great Britain:—

DISTRIBUTION OF EXTERNAL TRADE.

TRADE WITH	1886.	1887.	1888.	1889.	1890.	1891.	1892.
	£	£	£	£	£	£	£
British {Imports from	3,089,737	4,277,309	4,730,798	7,098,463	7,825,266	7,020,493	7,691,195
United Kingdom. {Exports to ...	6,694,735	7,460,106	8,409,606	8,847,322	9,392,233	10,676,017	11,576,370
British {Imports from	344,146	315,966	410,948	442,659	636,430	641,599	643,277
Possessions. {Exports to ...	91,426	81,811	109,443	86,891	82,667	113,620	89,297
Foreign {Imports from	365,378	442,860	536,591	804,943	904,760	910,874	1,112,769
Countries. {Exports to ...	339,195	317,057	358,208	334,869	362,896	326,594	312,400
Total External {Imports	3,799,261	5,036,135	5,678,337	8,446,065	9,366,446	8,572,766	9,487,241
Trade. {Exports	7,125,356	7,868,974	8,876,657	9,269,082	9,837,796	11,116,231	11,978,067
Grand Total.....	10,924,617	12,895,109	14,554,994	17,715,147	19,204,242	19,688,997	21,465,308

The distribution of internal trade for 1892, as shown by the returns of goods entered for consumption and removed beyond the borders of the Colony, was as follows.—

To Basutoland	£35,644
To British Bechuanaland	85,947
To the Orange Free State	594,301
Under rebate to South African Republic ...	1,185,667
" to Bechuanaland Protectorate and	
other territories	26,041
Entered for consumption in Cape Colony ...	6,480,966
Besides Colonial Government articles valued at ...	796,224

The articles of merchandise imported, with their values for 1891 and 1892, may be grouped as follows:—

	1891.	1892.
Arms and Ammunition	£165,933	£223,553
Textile Fabrics, Dress, &c.	2,888,497	3,171,370
Food, Luxuries, Drinks, Stimulants, &c....	1,818,483	1,819,994
Animal and Vegetable Substances	401,762	428,069
Minerals, Metals, Precious Stones, &c. ...	365,417	413,154
Building Materials	769,726	1,068,637
Live Animals	11,508	15,432
Miscellaneous Items	1,097,111	1,550,808
Colonial Government Articles	1,054,329	796,224
Specie... ..	10,010	84,429
Total	£8,582,776	£9,571,670

The total value of Exports, the produce of South Africa, show an increase in 1892 over that of 1891, mainly due to the progressive output of gold, now amounting to over four millions, which, with slight exception, is exclusively the produce of the South African Republic:—

	1891.	1892.
Produce of Mining, Copper, Crocidolite, Salt, Diamonds, and Gold ...	£7,215,436	£8,258,044
Produce of Sheep, Cattle, Goat, and Ostrich-farming ...	3,620,402	3,420,581
Produce of Grain-farming ...	14,094	8,671
„ Wine-farming ...	24,562	25,322
„ Gardens... ..	2,697	3,152
„ the Sea	27,731	25,046
„ the Forest and Chase ...	16,565	25,177
„ Sundry Industries ...	10,237	3,906
Miscellaneous and Unenumerated ...	3,250	4,657
	<u>£10,934,974</u>	<u>£11,774,556</u>

The importance of the pastoral industry, which is indicated in the above return, is more clearly shown by the statistics of live-stock in the Colony in 1875 and 1891 respectively:—

	In 1875.	In 1891.
Cattle	1,111,713	2,210,834
Horses	205,985	444,147
Mules and asses... ..	29,318	96,245
Woolled sheep	9,986,240	13,631,011
Other sheep	990,423	3,075,005
Angora goats	977,988	3,184,018
Other goats	2,187,214	3,444,019
Ostriches	21,731	154,880
Pigs	116,738	288,190
Hogs	140,948	302,804

Included in the foregoing for 1891 are the returns from the Transkeian native territories, which comprise:—Cattle, 653,660; horses, 90,014; woolled sheep, 1,423,833; other sheep, 85,605; Angora goats, 91,379; other goats, 563,671; pigs, 79,891; and hogs, 121,270.

Of the inland colonial trade, and the value of exports across the borders to the neighbouring States, viz., wagons, cattle, sheep, grain, spirits, wine, fruit and other productions, there is no official record.

The comparative returns of shipping at the different ports of the Colony show that the tonnage inwards rose from 4,002,095 in 1891 to 4,185,901 in 1892, and the tonnage outwards similarly from 3,950,829 to 4,197,828 tons.

REVENUE AND EXPENDITURE.

While the progress of the Colony is more directly indicated by its population, trade and productions, it is also shown, although less directly, by its annual revenue and expenditure.

At present the chief sources of colonial revenue are customs duty, transfer duty, stamps and licences, land revenue and railways. Besides these may be mentioned telegraph revenue, land sales, reimbursements, miscellaneous receipts, bank-notes duty, hut tax and others, which bring in less than £100,000 each per annum. Some of these in recent years, such as reimbursements and miscellaneous receipts, yield much less than they otherwise would do, in consequence of a growing practice to carry such items to the credit of the proper votes for expenditure instead of to revenue, thereby equally diminishing both the apparent revenue and expenditure; on the other hand, the head "railway revenue," which had no existence till 1873, yielded no less a sum than £2,002,040 in the financial year 1891-2—that is in the year from 1st of July, 1891, to the 30th of June, 1892.

In the calendar year 1866, the total revenue from all sources amounted to only £536,347, and in the financial year 1891-2 it amounted to £4,495,344, or excluding railway revenue to £2,493,304. The latter amount indicates an increase of about 344 per cent., or on an average nearly 17 per cent. per annum on the revenue of 1866.

The actual rate of progress, however, has been far from constant, even the comparatively short period of 26½ years having included more than one cycle of general depression and shrinkage; but without entering into details, variations in the rate of progress are sufficiently shown by the following averages:—

Period.	No. of Years.	Average Annual Revenue.
		£
1/1/66—31/12/70	5	586,192
1/1/71—30/ 6/76	5½	1,274,969
1/7/76—30/ 6/81	5	2,106,369
1/7/81—30/ 6/86	5	3,241,792
1/7/86—30/ 6/91	5	3,799,476

The revenue may be classed under four heads:—(a) Taxation (including Customs, Transfer Duty, Stamps and Licences, &c.); (b) Income from the Colonial Estate (including Land Revenue, Hut Tax, Land Sales, Mines, &c.); (c) Payment for services ren-

dered (including Railway, Telegraph, Postal Revenue, &c.); and (d) Sundry heads, which cannot well be classed under any one of the preceding heads.

Such an apportionment of the revenue cannot conveniently be given for any year previous to the financial year 1876-77, but the three quinquennial averages from the 1st of July, 1876, already given, may be shown, as follows:—

Period of 5 Years.	(a) Average Annual Taxation.	(b) Average Annual Income from the Colonial State.	(c) Average Annual Payment for services rendered.	(d) Average Annual other.
	£	£	£	£
1/7/76—30/6/81	1,238,558	628,502	201,741	37,569
1/7/81—30/6/86	1,611,078	1,280,805	258,787	89,236
1/7/86—30/6/91	1,576,153	1,887,769	298,105	37,449
Annual Average for whole period.....	1,475,263	1,265,692	252,878	54,751

The ordinary expenditure of the Colony may be similarly exhibited, as follows:—

Period.	No. of Years.	Average ordinary Expenditure.
		£
1/1/66—31/12/70	5	640,030
1/1/71—30/ 6/76	5½	901,940
1/7/76—30/ 6/81	5	2,052,545
1/7/81—30/ 6/86	5	3,448,420
1/7/86—30/ 6/91	5	3,570,529

Such expenditure is charged to one or other of about 85 annual votes, and is again classed according to the nature of the service under 21 principal heads.

The last published report of the Controller and Auditor General, that for 1890-91, shows that, during the fifteen years to the 30th of June, 1891, the total revenue has amounted to £45,728,762, while the ordinary expenditure for the same period has amounted to £45,508,967. The latter includes £9,615,038 spent on the working and maintenance of railways, and £12,999,031

paid as interest on and redemption of the Public Debt—excluding from the latter all loans converted or renewed.

While the above shows an aggregate excess of revenue over expenditure during 15 years of only about £220,000, there was a period of exceptional prosperity from 1870 to 1875, during which a deficit of £1,054,914 (with which the ordinary Revenue and Expenditure account opened on the 1st of January, 1870) was converted into an almost identical surplus of £1,054,748 on the 30th June, 1876, so that on the whole period from the 1st of January, 1870, to the 30th June, 1891, the excess of ordinary revenue over ordinary expenditure amounted to £2,338,882. It will be shown that the excess of these savings over the deficit balance on the 1st of January, 1870 (amounting to £1,283,968), may be said to have been invested in railways.

Expenditure chargeable to Loan Acts.

While expenditure on many public works of very considerable importance has been charged as ordinary expenditure, and is thus included in the amounts already mentioned as paid out of ordinary revenue, the greater part of the expenditure on the construction of railways, on a number of more important public works, and on the suppression of native disturbances, etc., has been charged in separate accounts to the proceeds of loans raised.

Previous to 1876 the accounts of the Colony did not exhibit any such marked distinction as regards expenditure, but the accounts from 1870 to 1875, inclusive, have been recast by the present Controller and Auditor-General from that point of view, and the results may be summarised in quinquennial periods as follows:—

Period.	Total Expenditure Railway Con- struction.	Total Expenditure Other Public Works, &c.	Total Expenditure Native Rebellion.
	£	£	£
1/1/70—30/6/76	2,070,354	256,781	...
1/7/76—30/6/81	6,710,675	820,612	3,098,135
1/7/81—30/6/86	5,361,103	701,710	1,696,600
1/7/86—30/6/91	2,920,896	163,654	...
Total to 30/6/91	17,063,028	1,942,757	4,794,735

Besides the above, £310,663 has been expended in payment of

those liabilities of Griqualand West which existed at the time of its annexation to the Colony, and £228,769, forming a portion of moneys advanced since 1882, out of borrowed moneys, as loans for Irrigation and Public Works carried out by local bodies or private persons, is still outstanding.

PUBLIC DEBT.

The oldest existing public loan of the Colony dates from August, 1863. The issue of debentures represented £255,400, and the existing balance of this loan (reduced by Conversion to £122,300) is repayable on the 31st of December, 1900.

Nearly all the loans raised from 1852 to 1866 bore interest at 6 per cent., but the particular loan above referred to bears only 5 per cent. interest, and, as might therefore be expected, it was raised at a large discount.

The existing 6 per cent. public loans, including those raised for Harbour Boards, fall considerably short of £200,000. About £750,000 has been raised on 5 per cent. perpetual annuities called Colonial Stock. This stock is now very valuable, and though less than ten years ago some of it was issued at par, it is now saleable at £129 per cent., and in view of the present price of $3\frac{1}{2}$ per cent. stock, is really worth much more than that. There also exists at the present moment nearly £800,000 of 5 per cent. debentures, issued in 1883, but these it is expected will be repaid before the end of the present year, 1893.

Between 1872 and 1880 large loans were raised at $4\frac{1}{2}$ per cent., subject to the operation of a cumulative 1 per cent. sinking fund. These have been partly repaid on annual drawings, and have been largely converted into 4 per cent. and $3\frac{1}{2}$ per cent. Consolidated Stock, so that the existing debt bearing interest at $4\frac{1}{2}$ per cent. scarcely exceeds £2,000,000.

Large loans bearing interest at 4 per cent. have been raised since 1883, and while they have been partly applied to cover railway construction and the suppression of native rebellion, they have chiefly been devoted to the redemption of other loans. Thus nearly four millions of 4 per cent. stock were issued in exchange for 5 per cent. debentures of the so-called 1883 or 10—40 loan, while between nine and ten millions of 4 per cent. stock have been issued under the authority of Act 16 of 1886, in exchange for debentures which bore interest at from 4 per cent. to 6 per cent.

Since March, 1890, all loans, whether raised in the Colony or in England, have been raised at $3\frac{1}{2}$ per cent. All these $3\frac{1}{2}$ per cent. loans, amounting at this date (February, 1893) to nearly $5\frac{1}{2}$ millions, have hitherto been raised at a discount varying from

13s. 3d. to £4 9s. 9d. per cent.; but according to the latest London quotations this stock is already at a premium of about 2 per cent., exclusive of accruing interest. To meet the convenience of the public it has been arranged that the domicile of these loans may on application be transferred from the Colony to London, or *vice versâ*.

APPROPRIATION OF THE PUBLIC DEBT.

•Omitting loans entirely paid off, the state of the Public Debt at this date (February, 1893) may be summarised as follows:—

Debentures or Stock originally issued ...	£28,282,865
Capital of Stock as affected by conversion ...	29 367,303
Present state of the Debt ...	27,284,578
Interest thereon for one year ...	1,094,622

Average interest per cent. about £4 0s. 3d.

As the Public Debt Statement for the calendar year 1892 has not yet been published, the above figures have been obtained by adding £2,514,611 to the capital, and £88,011 to the interest, as shewn in an analysis of the Public Debt on the 31st of December, 1891; and by making allowance as regards the third and fourth amounts for debentures expired or drawn for payment in 1892. The amount of £2,514,611 here quoted represents the capital of the 3½ per cent. loans issued since the 1st of January, 1892, to the present date (February, 1893), £1,080,000 having been raised chiefly for railway purposes early in 1892, and £1,434,611 solely for railway purposes during the present year.

It is scarcely practicable, in the absence of the Public Debt Statement for 1892, to apportion the existing debt among the several services for which it has been raised, for in the course of the year 1892 £63,500 of the debt, as it existed on the first of January, 1892, has been paid off, or at least has become payable, and at present it cannot readily be ascertained how much of this sum represents loans raised for railways, how much loans for war expenses, &c.

An apportionment, however, is easily given of the item described as "Original Capital of Loans as affected by Conversion," £29,367,303, by adding the loans raised since 1st January, 1892, to the apportionment given in the published Analysis of the Public Debt of the Colony on the 31st of December, 1892.

From this it appears that, as affected by conversion, the original loans for railway construction represent £19,408,839; for harbours and other productive public works, £3,394,030; for advances for local works, £340,690; and for non-productive services,

£6,223,744. It also appears, by the figures already quoted, that since 1870 £2,082,727 of the Public Debt has been paid off, of which about £112,000 has been contributed by Harbour Boards. The remainder has, along with the interest, figured as ordinary expenditure of the Colony. About £1,170,000 of the above represents railway loans repaid.

The above item of £6,223,744 described as having been raised for non-productive services includes £4,152,433, which forms the greater portion of the expenditure on the suppression of native disturbances. It also includes £772,452, raised between 1863 and 1871 to cover deficiencies of ordinary revenue and other services which cannot in any sense be called reproductive. But it also includes loans raised for the construction of roads, bridges, hospitals, the Houses of Parliament, to provide subsidies to private companies to induce them to construct railways, and such like, which, though technically "unproductive," seeing that they do not bring in any direct revenue, must be considered as in other ways beneficial to the community.

RAILWAY CONSTRUCTION.

The capital of the existing debt for railway purposes by no means represents the Railway Capital Account. Not only has nearly £1,200,000 of the original loans for such purposes been repaid in cash out of ordinary revenue, but on the 30th of June, 1891—the latest date for which published returns are as yet available—upwards of a million and a half had then been spent on railway construction out of surplus revenue.

Even this does not cover all the ground, for several services which properly belong to railway construction have from time to time been provided for in the ordinary votes for the working and maintenance of railways, and their cost is thus included in the ordinary expenditure of the Colony.

RAILWAY EARNINGS.

It only remains to consider how far the Construction of Railways has proved a profitable investment; and as it is quite impossible to reduce to figures the enormous indirect advantages of cheap and speedy transport between different parts of the Colony, attention is necessarily confined to its purely commercial aspect as an investment.

From this point of view it must be admitted that for a number of years the railways of the Colony did not pay full interest on the capital invested, and indeed some lines do not even yet pay their working expenses.

In June, 1891, the Controller and Auditor-General prepared an account showing approximately the capital expenditure on Government railways, the interest actually paid on such capital, and the net profits on the working of such railways from the 1st of January, 1873, to the 30th of June, 1890. According to this account the net profits, or excess of revenue over working expenses, from 1873 to 1890 amounted to £4,635,907, while the interest actually paid on borrowed capital amounted to about £5,967,795, showing in 16½ years an excess of interest paid over the net profits of £1,331,888, or an average loss of about £80,750 per annum. The direct loss during the above period is really considerably more than is here stated, for no interest has been charged on the large contributions from surplus revenue, whether duly authorised to be appropriated for railway purposes or temporarily advanced. Nor has interest been charged on the railway loans repaid out of current revenue.

The successive annual reports of the General Manager of Railways, however, show that in recent years the Colonial railways have, as a whole, returned a very fair interest on the capital, as follows:—

Calendar Year.	Capital Expended.	Capital entitled to Interest.	Net Earnings.	Percentage of Earnings on Capital.
	£	£	£	£ s. d.
1888	14,214,308	14,214,308	695,356	4 17 10
1889	14,526,929	14,282,766	822,129	5 15 1
1890	16,263,528	14,655,889	849,125	5 15 10
1891	18,175,310	16,686,731	778,727	4 13 4

While the above averages are very satisfactory, this condition is due to the fact that, while several lines pay very well, one line in particular, viz., the main line on the Midland System, yields a splendid return, which more than covers the losses on certain other lines. For example, this main line has yielded the following percentages on its capital:—In 1888, £12 4s. 11d. per cent.; in 1889, £13 6s. 9d. per cent.; in 1890, £13 8s. 10d. per cent., and in 1891, £11 9s. 9d. per cent. On the other hand, several lines usually show a deficit—that is to say, the revenue does not even cover the working expenses. Thus, in 1888, the line to Graaff Reinet shewed a deficit of £14,524, or a loss of £1 1s. 1d. per cent. on the capital in excess of interest paid thereon. On the King Williamstown branch the loss on a very much smaller

capital was £1 15s. 11d. per cent. Besides these there were two other smaller losses. In 1889 five lines showed losses, of which the largest—that on the Graaff-Reinet line—was £11,854, or £0 17s. 2d. per cent., while the largest percentage loss was £1 1s. 6d. per cent. In 1890, four lines showed losses, the highest percentage being £0 16s. 10d. per cent. In 1891, four lines again showed losses, the heaviest loss as well as the largest percentage (£1 11s. 7d. per cent.) being on the line from Wynberg to Simon's Town.

BANKING.

The banking business of the Colony is conducted by three Imperial banks, viz., the Standard Bank of South Africa, which has seventy-two branches throughout South Africa; the Bank of Africa, with twenty-four branches; the African Banking Corporation, with eighteen branches; and one small local concern, the Stellenbosch District Bank.

By the Colonial Bank Law (No. 6 of 1891) stringent provisions are enacted to secure publicity from time to time in regard to the position of the banks. It is also required that every bank or banking firm issuing bank-notes within the Colony, shall deposit with the Treasury, Government securities to the amount of the issue. The bank-notes so issued—of the denominations of £20, £10, £5, and £1—are legal tender everywhere, except at the chief place of business, or other places specified on the note, where they are redeemable in gold. By this provision, holders of notes are protected against default; and for any deficiency in the proceeds of the securities deposited with the Treasury, the Government has a first lien upon the assets of the bank. The Cape bank-notes are by far the safest and most popular notes now circulating in South Africa, being covered by the unlimited responsibility of the issuing banks, together with the State guarantee.

In Natal, in addition to the institutions already mentioned, a large business is conducted by the Natal Bank, who act as bankers to the Government. In the Orange Free State, banking business is fairly divided between the National Bank and the Bank of Africa; the former being virtually a State bank, but without any privileges. In the South African Republic there is also a National Bank, in which the State is but slightly interested, the bulk of the capital having been found in Holland and Germany. The institution, in terms of its concession, has valuable privileges, and its notes, though unsecured and without bearing the responsibility of the State, are a legal tender in the Republic. The bank

by a separate concession has also the conduct of the new State mint at Pretoria.

Turning to the outlying territories, there is no banking accommodation in Zululand, Swaziland, or Basutoland; but the Standard Bank has established branches at Vryburg, Mafeking (Bechuanaland), and at Salisbury, Mashonaland; while the Bank of Africa has opened at Delagoa Bay. The Natal Bank has opened at Ermelo and Pietersburg (South African Republic) but closed at Smitsdorp. The National Bank has opened at Barberton, Leydenburg, Ermelo, Vryheid, and Middelburg, but has closed at Boksburg.

The Imperial banks, by which the main business of the country is carried on, have their colonial headquarters in Cape Town. The following are the principal figures, showing their operations, as summarised from the published statements in the *Cape Gazette*, as at 31st December, 1892:—

		Within the Colony.	Without the Colony.
<i>Standard Bank.</i>		£	£
Liabilities.	Capital and Reserve . .	..	1,615,000
	Note Circulation . .	428,107	186,120
	Deposits Fixed . .	1,334,790	1,672,747
	Deposits Floating . .	2,284,673	2,173,026
Assets.	Coin and Bullion . .	1,098,580	759,277
	Government Securities . .	747,189	773,648
	Discounts . .	2,254,541	1,585,258
	Advances . .	850,542	1,142,935
<i>Bank of Africa.</i>			
Liabilities.	Capital and Reserve . .	..	360,000
	Note Circulation . .	46,701	92,348
	Deposits Fixed . .	552,355	599,498
	Deposits Floating . .	509,907	578,526
Assets.	Coin and Bullion . .	215,745	373,962
	Government Securities . .	114,845	48,312
	Discounts. . .	308,038	295,010
	Advances. . .	227,048	234,406

		Within the Colony.	Without the Colony.
<i>African Banking Corporation.</i>			
Liabilities.	Capital and Reserve . .	..	297,660
	Note Circulation . .	112,887	..
	Deposits Fixed . .	478,190	223,079
	Deposits Floating . .	381,948	213,292
Assets.	Coin and Bullion . .	192,964	91,083
	Government Securities . .	144,000	63,168
	Discounts . .	580,425	133,312
	Advances . .	169,125	234,406

The position of the Natal Bank in respect to its more important figures, was as follows on December 31st, 1892:—Circulation, £22,179; deposits fixed, £298,427; deposits floating, £558,024; coin, £310,532; advances, £489,939.

That of the National Bank of the Orange Free State on 31st October, 1892:—Circulation, £53,614; deposits fixed, £274,004; deposits floating, £219,867; coin, £126,099; advances, £408,212.

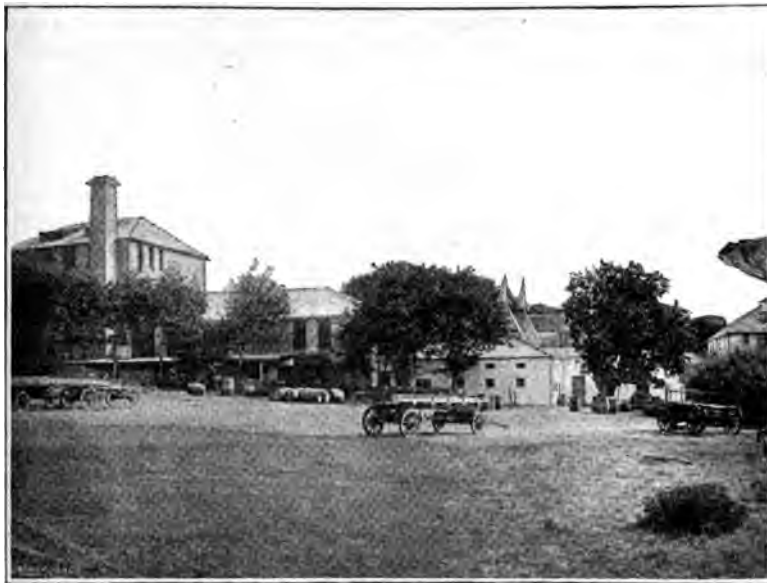
That of the National Bank of the South African Republic, on 31st December, 1892:—Circulation, £83,539; deposits fixed, £291,551; deposits floating, £961,947; coin, £679,947; advances, £571,088.

Speaking generally, banking business is now conducted on sound lines, and the more frequent publication of balance-sheets tends to produce caution on the part of the banks, and enables depositors to take an intelligent interest therein.

COLONIAL INDUSTRIES.

The manufactures of South Africa are not as yet extensive, the bulk of the population being devoted to the development of the natural resources of the country. In the Cape Colony, according to the census returns, the total number of industries and works (exclusive of mining) carried on in 1891 was 2,195, and the number of hands employed were 15,934 males, and 2,851 females. Of these, 327 establishments used steam or gas engines, aggregating 4,840 horse power. The value of machinery and plant was £1,030,348, and of buildings and improvements, £1,178,803. The materials used amounted to £3,353,076, and the value of articles produced was £5,639,027. Of flour mills, there were no less than

262 in the Colony, producing in the year 80,360 tons of meal and flour. The South African Milling Company are noted for the extent of their operations and their development of this particular industry. Bread and biscuit works were represented by 106 establishments, with an output of £387,313. Confectionery, preserves, and jam making receive a stimulus from the provision made by the legislature, granting a rebate of duty on sugar used wholesale in their manufacture. The preserves of the Cape and Natal gooseberry, naartje, orange, lime guava, quince, fig, melon, citron, peach, and apricot, surpass many of the English articles,



OHLSOON'S BREWERIES, NEWLANDS.

and they are now being made for wholesale exportation. At Anderson's Port Elizabeth Confectionery Works, chicory is also manufactured, the firm encouraging the farmers to grow the roots by guaranteeing to take all they produce of standard quality at a fixed price.

Brewing is chiefly carried on in Cape Town and its neighbourhood; the principal establishments being those of the Ohlsson's Cape Breweries Company, Limited, at Newlands. These breweries have a ninety-five quarter plant, are worked by steam and equipped with all the best appliances and materials. Their ales and stouts are consumed all over the colony. A considerable

quantity of colonial agricultural produce is utilised in connection with the breweries, the barley used for malting for the year being 36,000 bushels; but hops and a large quantity of malt are imported.

The manufacture of Cape wagons and carts is a special colonial industry, the chief localities where it is carried on being the Paarl, Worcester, Oudtshoorn, Graham's Town, and King William's Town. The number of hands at work in 1891 was 3,016, the value of material used £336,276, and of completed articles £635,276, the output being about 3,000 wagons, 4,000 carts and 450 other vehicles. Saw-mills turned out goods to the yearly value of £184,515. The manufacture of furniture and cabinet-work from the indigenous woods of the country has recently come into favour, and some exquisite suites of drawing-room and bedroom requisites have been produced by the leading firms in Cape Town. The railway workshops and depots, including the engineering and locomotive departments, afford occupation for about 2,500 persons, chiefly Europeans. The wool-washing, fell-mongering, and tanning industries yield an annual income of nearly one million sterling, and employ over 1,260 hands. Cape leather, with the exception of pig-skins for saddles, is equal in all respects to the best that can be imported, and there are many establishments for its manufacture into boots, and other articles. Tobacco, cigar, and snuff manufactories give an output of £68,079 in the year. Tin and plumbers' workshops and iron foundries number in all 65, employing 487 hands, with a production of £86,570. Distilleries, brick and pottery works, and match factories, printing, book-binding, and engraving, embrace the remainder of the chief industries. The only woollen mill is a blanket factory at Waverley, near Ceres Road Station. A mill for the manufacture of tweeds was started in Graham's Town four or five years ago, but it was lately relinquished, and the machinery transferred to the neighbouring colony of Natal. The Cape exports all her wools, and imports manufactured woollen and other textile fabrics.

The fisheries of the Colony are of increasing value and capable of great development. The official return of fish caught at the fishing-stations on the coast gives the number at 14,185,370. The boats or vessels employed, chiefly sailing-boats, are about 300, and fishermen engaged in the industry number over 1,400. The annual exports of salted or cured fish, principally to Mauritius and Natal, are valued at £16,722; but the internal consumption is more than double that amount. The edible fish comprise some fifty varieties, and many of these are equally as good and well-flavoured as the European ones. Among them are the sole, stock-

fish, klipfish, elf, roman, seventy-four, galleon, Hangberger, Hottentot, Jacob Everstein, silver-fish, red and white stumpnose, gurnards, snoek, kabeljauw, geelback (Cape salmon), harder or mullet, mackerel steenbrass, dagaraad, skate, albacore, sand-creepers, sardines, and anchovies. Algoa Bay abounds with soles, which are caught by steam trawlers. In False, Hout, and Table Bays, and in fact in all the sandy bays along the coast, they are also to be found. The Cape lobster (crayfish) abounds in Table Bay, the haul being sometimes as much as 14,000 a day, and a canning factory has recently been established, which has sent large shipments to Europe with considerable success. Indigenous oysters are found more or less all along the coast eastward of Cape Point. At Mossel Bay and Knysna about 300,000 are collected yearly. They are raked off the rocks at low tides, indiscriminately, without regard to size. Artificial culture to any extent has not yet been tried.

An experiment to introduce trout into the Cape Colony has received encouragement from the Government, and been attended with success. A hatchery was provided by Mr. Ohlsson at Newlands, and under the direction of Mr. L. Maclean, of the Castle Steamship Company, and Mr. E. Latour, the fry hatched out from the ova imported have been distributed, at chosen spots, in the upper waters of the Eerste River, Lourens River, Breede River, and Berg River.

CHAPTER X.

LAND AND AGRICULTURAL PRODUCTIONS.

THE Cape Colony is estimated to comprise an area of 141,648,169 acres of land. The quantity disposed of up to the end of 1892 was over 98,000,000 acres, and the total area still undisposed of is estimated at 43,640,963 acres, in which are included missionary institutions, native locations, outspans, commonages, and leased lands.

Under the provisions of the present land law—Act No. 15 of 1887—the mode of disposal of all Crown lands (with the exception of small agricultural areas) is by public auction. Notice of intended sales are published in the official Gazette and district newspapers. These describe the position and extent of the land, state the minimum or upset price fixed by Government, and the amount of the expenses of beacons, survey and title, which are to be paid by the purchaser on the day of sale. The highest bidder becomes the owner. He may pay the whole or part of the money at once; but he must pay at least one-tenth by the end of six months from date of sale; and in so far as not sooner paid, one-fifth of the purchase price must be paid at the end of twelve months. Interest on the amount or balance is payable at the rate of 4 per cent.; and, if not paid, its payment must be secured as regards the one-fifth by two sureties, and the remaining four-fifths by a mortgage bond, cost of passing which must be defrayed by the purchaser. The bond may at any time be paid off, or any part, not less than £50 at a time. Lands thus sold are subject to certain stipulations, set forth in the conditions of sale, one being the reservation by Government of gold, silver, precious stones, and the working of mines. The average price per acre obtained for these waste Crown lands in the several divisions of the Colony vary, according to quality and position.

During the year 1892, an extent of upwards of 2,000,000 acres of land was disposed of at auction for a total purchase amount of £128,025, the largest extent being in the divisions of Kenhardt, Calvinia, Sutherland, and Ceres.

The Agricultural Lands Act 37 of 1892, amended by Act 40 of 1885, provides for the disposal of small holdings suitable for

agricultural purposes, and its advantages are being much appreciated by immigrants and others. The areas must not be less than eight, nor more than 500, acres in extent. Application for these must be made to the Civil Commissioner of the division in which the land is situated, and referred to a local Land Board for report. An approved applicant receives a licence to occupy the area for five years, for a yearly fee equal to one-twentieth of the price fixed for the land. Within six months he must personally reside upon the ground, and within two years must either enclose or bring under cultivation a twentieth part of the holding, failure to act upon these conditions rendering him liable to forfeiture. Upon the expiration of the period of licence and completion of all conditions, quit-rent title may be issued, the quit-rent being the same as the licence fee.

Freehold or quit-rent properties, which have been in occupation of private persons, may generally be acquired by purchase. Their value for agricultural and pastoral purposes depends much upon the improvements made, the buildings erected, the dams constructed, the permanency of the fountains, the nature of the herbage, the extent of arable land, and proximity to a market. First-class farms with buildings may be purchased for from about 30s. to 40s. per acre. In the midland districts they may be had at from 15s. an acre, down to 7s. 6d.; and others in the back districts range from that figure to as low as one or two shillings per acre. In some localities, such as the fertile, irrigable area of Oudtshoorn, land sells at the rate of £50 to £150 per acre.

Farming, in industrious and intelligent hands, is a lucrative occupation. But new-comers desirous of pushing their fortunes in this direction will find it to their advantage to obtain an initiation into the colonial peculiarities of seasons, soil, pasture, management of stock, and, it may be added, native labour, as well as some acquaintance with the vernacular Cape Dutch, the spoken language of a large portion of the country population. A short time spent in observing and getting accustomed to colonial ways is amply repaid by the experience gained.

The importance of stimulating the development of the agricultural and pastoral capabilities of the country has been lately recognised by the Government, which has created a Department of Agriculture, to keep in touch with the farming population, and assist them in the improvement and expansion of their present industries. Agricultural colleges, where young men may have a scientific as well as a practical training and experience, have been established at certain centres, such as Stellenbosch, Somerset East, and Graham's Town. An experienced veterinary surgeon with three assistants, and a bacteriologist, attend to the investigation

and curative treatment of stock diseases. Viticultural and tobacco experts are engaged in the development of wine and tobacco culture. There is also a colonial botanist, an analyst, and an entomological adviser, ready to give information on matters relating to pastures and soil, or insect plagues. And to assist the community generally, the Department procures and distributes new and valuable seeds of cereals and plants, directs attention to useful labour-saving machinery, and diffuses much valuable information to farmers, explaining the true principles of cultivation, through the medium of an *Agricultural Journal*, published both in English and Dutch.

The diversity of soil and climate at the Cape enables every variety of product and fruit to be grown. In those parts which are generally visited by copious rains, such as the south-western and eastern coast regions, the agricultural capabilities are practically inexhaustible. In other portions, where the rainfall is light, and has to be supplemented by means of irrigation, experience has shown that the careful cultivation of a small acreage of the rich Karroo soil can be made as profitable as extensive areas elsewhere. And when systematic investigation is made of the position and volume of some of the rivers, the levels of the country, and other details connected with the carrying out of comprehensive irrigation schemes, even a great portion of the driest parts of the inland districts may be profitably utilised, as has been the case in America and Australia.

The census statistics of 1891 showed that the Colony produced in the year 2,727,490 bushels of wheat, 1,810,129 bushels of oats, 1,876,936 hundred pounds of oat-hay, 923,064 bushels of barley, 2,894,482 bushels of mealies (maize), 1,387,610 bushels of Kafir corn, 527,425 bushels of rye, 186,276 bushels of peas and beans, 760,047 bushels of potatoes, 491,922 bushels of sweet potatoes, 6,178,671 pumpkins, 106,991 bushels of onions, 282,926 hundred pounds of mangold wurzel, 109,931 hundred pounds of tobacco, besides orchard produce.

The wheat crop has hitherto, in the best of seasons, been barely sufficient for the country's requirements, and it is only at rare intervals that there has been any balance left for external export. In the year 1871-72, about 90,000 bushels were sent from the Colony to the London market, and the quality was pronounced by brokers and millers to be of the finest description. Later in 1887-88 the exports of colonial grain, chiefly from the border, were £24,000 and £26,000 respectively. But in 1890, owing to severe drought, the harvest was deficient, and the Colony was compelled to get food supplies from abroad to the amount of £230,000. The season now completed (1892-93) is reported to

be one of plenty, and likely to meet all the requirements of home consumption.

The most important wheat-growing centres in the western districts of the Cape are Malmesbury, Piquetberg, Caledon, and Oudtshoorn. These four districts, in 1891, contributed over 800,000 bushels to the total yield of 2,727,490 for the whole Colony, and their production during 1892-93 is estimated to have increased by one-third more. The other western coast districts give a yield of from 30,000 to 80,000 bushels each per annum. This is irrespective of other grain crops, such as oats, barley and rye, &c. In the eastern districts, Albert, Wodehouse, Barkly East, Graaff Reinet, Middleburg and Herschel, stand foremost on the list of wheat-producers, varying from 50,000 to 85,000 bushels each. The defective character of our agricultural statistics prevents any definite information as to the area cultivated and the actual yield per acre. As a rule, the seed is sown very thin, only some 30 to 40 lbs. to the acre, as against 150 to 200 lbs. in England, and although the return from the amount sown is as great, if not greater in the Colony, the yield per acre compares very unfavourably with the home and other countries. In portions of the Malmesbury district the return of wheat is not more than ten or twelve for one, which would be at the rate of five or six bushels to the acre; but in other parts, where the soil is well cultivated, it varies from fifteen to twenty-five fold, or at the rate of about eight to twelve bushels to the acre; and in some of the eastern and Karroo districts it ranges as high as twenty bushels to the acre. In parts of the Calvinia division, the channels of some of the rivers, such as the Fish or Zak River, are so shallow that in ordinary floods they overflow the banks, depositing rich fertilizing matter, in the shape of silt, far and wide over the extensive flats. There the crops reaped on one farm amount to 20,000 bushels, and the yield is from fifty to seventy fold. The stalks grow to a height of from 5 to 7 feet, and the ears measure from 6 to 9 inches, full and well developed. After the first crop is reaped, a second one may be expected without sowing, and sometimes even a third one comes up.

Seed-sowing in the west commences after the first rains, about the middle of April; oats being sown usually if weather permits, from the 20th of April to the 30th of May, and wheat from the 15th of May to the 30th of June. In exceptional seasons, much later ploughing is done, with good results. The seed is sown broadcast, and harrowed afterwards. The oats intended for hay are sown thickly, and cut down just as they begin to show signs of ripening, and while the sap is still in the stalk. The hay or oat-sheaves so made form a sweet and wholesome fodder for horses

and cattle, which fetches, if fair or good quality, from 3s. to 6s. per 100 lbs. weight, according to season and demand. Barley is very prolific, the Cape barley more so than English malting kinds. The actual return on farms, which could be named, was 330 bushels from three. The average return is about 40 bushels per acre, and it realises from 9s. to 15s. per bag of three bushels. Rye is not so largely cultivated as other cereals. It is generally used for horse feed, and the straw for thatching purposes. It yields well, and requires the lightest and most sandy soil. Several varieties of wheat are grown, but the principal are those known as the Baard and Du Toits, which weigh at the rate of 67 to 70 lbs. per bushel.

By the end of October the early crops begin to ripen, and the harvest extends from then until the beginning of December, according to the season. A drive through the cornlands of Malmesbury, Riebeek's Kasteel, and Piquetberg at that time is a most enjoyable treat; for fifty or sixty miles on a stretch the eye rests everywhere on a fast-ripening harvest of all shades and shape of growth, waving and glittering in the brilliant sunlight. The crops are reaped by reaping-machines, scythes, and sickles. In many places the state of the land is not adapted for machines, the field being too rough and the roller seldom applied, causing constant breakages. Mowers and reapers—native labourers of the mixed races—receive during this time 2s. 6d. per day, with food and wine. Six reapers, two binders, and two bundle-makers generally form a team, and at times there may be seen as many as seven or eight of them at work in a field, each team straining every muscle to outdo the other. The self-delivery reaper is now, however, replacing the sickle; about 1,500 of them have been introduced into the Malmesbury and adjoining districts. The Johnston's Harvester, Walter A. Wood, McGregor's Albion, Hornsby's Indispensable, and McCormack's Daisy are all worked, but the first two are mostly used. Thrashing is chiefly done in December and January. A large proportion of the farmers who own small holdings do not invest in machinery; but there are a number of steam thrashers, principally Clayton and Shuttleworth's make, moving about the districts, competing with each other for employment. An 8-horse thrasher (the size commonly used), in fair working order, will clean in a day's work 900 bushels of wheat, or 1,350 to 1,650 bushels of oats. Barley or rye is generally tramped, or, if thatching-straw is required, the latter is beaten out in bunches by the hand. Tramping means the primitive practice (described in Scripture) of driving the mules or horses round a circular threshing-floor, their feet beating out the grain, which is cleaned by throwing it up against the

wind, the heavy grain falling to the ground, the chaff being carried away; but this tedious process is seldom practised now for wheat and oats, or only by the small and poor farmers. The riding season, or bringing of the grain to market, used to occupy three months of the year, but the proximity of railways has brought the farmer within easy access of the markets. Formerly a poor harvest insured high prices, but in these days of quick and cheap freight, aided by the telegraph, the price is regulated by what grain can be imported for, and it has ranged for several years from 22s. down to 16s. per 3 bushels (203 lbs. gross), including 2s. duty and cost of bag. Cape wheat always commands the top market value, if not a slight advance on even the best Australian imports.

In the districts mentioned—known from olden time as “the granary of the Colony”—the area of cultivation has wonderfully increased in the last decade. Formerly the limited and unsatisfactory supply of manual labour at the harvest time interfered with operations, but since labour-saving appliances have come into vogue, enabling the farmers, with only a few hands, to crop their fields at nearly half the cost, the industry has received a great impetus. Anything like the standard of “scientific farming” has not yet been attained, but the character and capabilities of the soils and their treatment are being better understood, as well as the rotation of crops and the use of manure and fertilisers. The extensive and valuable deposits of guano on the islands along the west coast have lately been taken entirely into the hands of the Government and sold direct to the agriculturists at £7 12s. per ton, about half the price it would realise in England; but no sale for export is permitted.

In the eastern coast districts, chiefly Alexandria, Lower Albany, Peddie, and East London, owing to the prevalence of rust, the area of land under wheat has decreased of late, and the production of soft wheat is almost a thing of the past. The chief varieties grown are blue corn, klein corn or Italian wheat, both bearded, and German kaleop, also a bearded variety. From the former a better class of meal is obtained, but, on the other hand, the latter is a more certain crop.

In the valleys the lands are usually sown in April and May, those at a higher altitude from June to August. The time of sowing, however, depends on when suitable rains fall; but from experience it is found that when the low-lying lands are sown early a much heavier crop is reaped than when the same class of soil on the same level is sown at a later period, while on the higher altitudes, where the land is poorer and climate colder, the late sown crop gives, as a rule, the best results. Reaping takes

place in November and December, by means of the stripper or sickle. On the large farms the former is used. Of late years the reaper and binder combined has been introduced, and is likely, as time goes on, to oust the stripper altogether.

During the last three years a number of varieties of wheat have been imported by the Agricultural Department and distributed in small quantities to the farmers in these eastern coast districts. Of the varieties only three have been found suitable for growth in the Colony, viz., Dakota (beardless), Medeah, and Neapolitan (bearded). The first-mentioned is a variety of wheat which has been largely grown in America for some years past, on account of its being more rust-resisting than the majority of the others grown there. In East London it has also stood the rust; in the Albany and Peddie districts, however, it has not done so well. Of the two bearded wheats, viz., Medeah and Neapolitan, the latter has, after the third season's growth, proved almost rust-proof. It resembles the Italian wheats long grown in the Colony, and with Mr. C. Cock, of Peddie, to whom the seed was given in the first instance, it has done remarkably well. The 8½ lbs. of Neapolitan wheat seed, which was sent to this gentleman by the Agricultural Department, has in three years yielded over 200 bags, and this is now being sold over the country to farmers at a price which far more than compensates Mr. Cock for the trouble he has taken experimentalising. Facts such as these are waking up farmers to give more attention to the selection of their seed, and to take greater care and trouble in the cultivation of the soil for the general crops.

Indian corn or maize, known under the name of "mealies," yields crops of good food, both for man and beast. Throughout the border, and in the Kaffrarian districts especially, where it enjoys the summer rainfall, it is largely cultivated. Kafir-corn or millet is chiefly raised by the natives. Potatoes and all kinds of European root crops, vegetables, and pot-herbs do well, and can be grown all the year round.

The major part of the colony is well adapted for the cultivation of fruits, and every description can be produced in abundance. Grapes, oranges, lemons, peaches, nectarines, apricots, plums, figs, cherries, strawberries, apples, pears, walnuts, chestnuts, almonds, guavas, loquats, grenadillas, quinces, bananas, and pineapples are among the varieties now grown. It has only been recently, however, that attention has been directed to the importance of utilising orchard products for other than local requirements. Inland railway communication has opened up colonial markets, and the rapid passages of the ocean mail steamers, with the appliances of refrigerating and cool chambers, has given facilities

for shipment to the markets of the United Kingdom. The Cape has the advantage of its seasons occurring conversely to those of Europe, and of thus being able to make shipments of grapes and other choice fruits at a time when the ordinary supply at home has ceased and good prices are procurable. Up to the present the shipments, amounting to 500 or 600 tons for the season, have been mostly of an experimental character, but the initial difficulties of properly handling, packing, and landing the fruit in good condition have now been surmounted, and the establishment of a fruit-growing and export industry gives promise of much success.

Another outlet for orchard produce is the preserving and drying of fruit. At present the quantity of dried fruits and raisins produced is over 5,000,000 lbs. weight per annum. Fruit-growers are beginning to learn that evaporators and other Californian methods of drying and canning are worth while being adopted, in order to work up their stock into a merchantable article.

CHAPTER XI.

CAPE VITICULTURE.

BY PROFESSOR P. D. HAHN, PH.D., M.A.

SHORTLY after the arrival of the first European settlers in Table Bay, the first vine-sticks were brought into the Colony, in 1653, from the borders of the Rhine. They appear to have flourished, and many more were brought in 1656, principally from the Rhenish provinces and France. The earliest account of a vintage is from the muscadel grape in 1659. In 1681 the first brandy was made; and in 1687 the total number of vines planted in the vineyards of the settlers, and in the Dutch East India Company's plantations, was more than half a million.

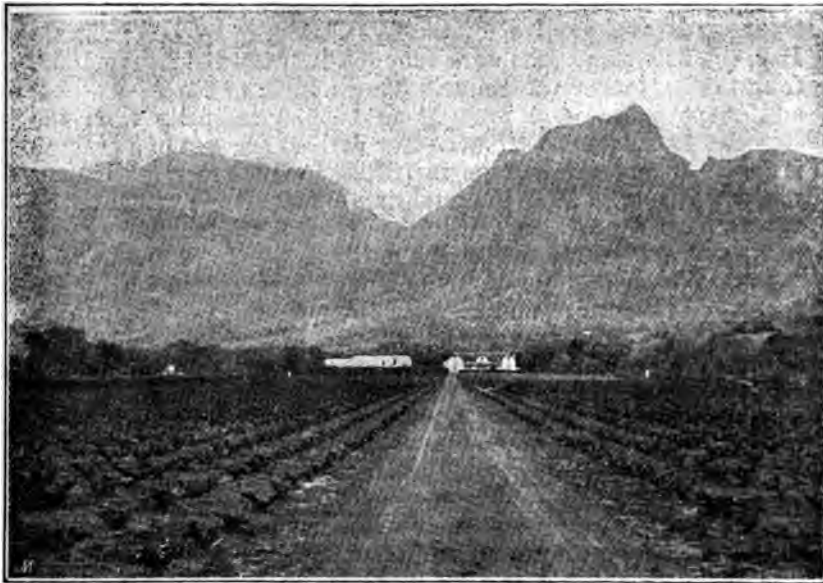
It has been thought that the Huguenots brought with them the art of viticulture, and the principal varieties of vines which are now cultivated in the Colony; but this is not so, as the Huguenots only arrived at the Cape in 1688, and twenty-five years earlier, cuttings were introduced from Germany and France. The Huguenot settlers certainly gave an impetus to the cultivation of the vine, and did much to improve the character of the wines produced. In 1710 the increase of cultivation was so great that, according to a return furnished by the Governor of the Colony, Lowe van Assenburg, to the Governor-General of Netherlands, India, the vines planted amounted to 2,729,300, and some small quantities of wine began to be shipped by the company to Java and to Europe. Ever since those days viticulture has occupied a prominent position amongst the several branches of agriculture in Cape Colony.

The total number of vine stocks in the vineyards of the Cape, as reported at the last census in 1891, was 78,574,124. The yield from them during the same year was returned at 4,964,616 gallons of white wine, 1,047,906 gallons of red wine, and 1,423,043 gallons of distilled brandy. This was exclusive of the grapes converted into raisins, to the weight of 2,599,147 lbs., and a very considerable quantity disposed of and consumed as fresh fruit.

Much attention has of late been given to the manipulation of the grape and the preparation of the wines, with the result that

in addition to the old description of vintages, such as dry and sweet Constantia, Sherry, and Pontac, light dry red and white wines have been produced which are now an article of general consumption. According to official returns, the colonial output of wines and spirits in 1890-91 was 3,857,430 gallons wine, and 1,460,000 gallons spirit, valued at £331,730. In the preceding year, 1889-90, the output was 4,680,000 gallons wine, and 1,115,308 gallons spirits, valued owing to the higher prices prevailing, at £529,932.

The cultivation of the vine is not met with in all parts of the



KLEINE SCHUUR VINEYARD, BONDEBOSCH (WINTER).

Colony. Most of the wine districts are in the western province; the production of wine and brandy in the Eastern Province being comparatively small. This is not so much due to the fact that the first wine-growers settled in the western part of the present Cape Colony or that for a long time the western part of the Colony formed the principal part of the European establishment, but principally to climatic conditions. There is certainly no portion of the world which possesses a climate more favourable to the cultivation of the grape, than the Western Province of the Colony. Here we have in spring a sufficient number of fine

days with bright sunshine, and also as much rain as will cause a very vigorous development of the buds, and a most luxuriant growth of the young shoots. Towards summer, bright sunshine reigns supreme, but the humidity of the air is still sufficient for the further growth of the bunches, which in January and February mature under an almost cloudless sky, and in a tropical temperature. Only certain parts of California, and of Southern France, enjoy a climate which is similar—but not equal—to that of the Cape. The enormous production of the vineyards, to which we shall refer further on, is solely due to the climate; it is true the soil is also fertile, but generally it is not superior to the soil in other wine-producing countries.

The principal wine districts are the divisions of the Cape, Stellenbosch, Paarl, Malmesbury, Worcester, Robertson, Montagu, Ladismith, Prince Albert and Oudtshoorn; the production of wine and brandy in all these districts is by far the greater portion of the total yield of the Colonial vineyards. They may conveniently be distinguished as coast districts and inland districts, inasmuch as the physical condition and chemical composition of the soil, and also the climatic conditions in these districts, are so different as to compel the wine-farmer to adopt different ways of cultivating the vine. The divisions of the Cape, Stellenbosch, Caledon, Malmesbury and Paarl exhibit a great similarity in soil and climate, and form the group of the coast districts, whereas all the other divisions may be called the inland districts. The rocks which contribute towards the formation of soil in the coast districts are granite, clay-slate, and sandstone. The best vineyards situated on hills or slopes, such as those of Constantia, Bottelary, Moddergat, Jonkers Hoet, Paarl, Groeneberg, and Riebeeck's Kasteel, are all on decomposed granitic soil, and there is no doubt that the produce of these vineyards is qualitatively superior to the wine produced in lower situations. The alluvial soil in the coast districts is formed from the constituents of granite, clay-slate, and sandstone, and is found along the courses of the Kuils, Eerste, Laurentz, and Berg River. The greatest difference in the physical properties, and in the chemical composition, may be observed in these vineyards, but in all the soil is distinguished by a very small amount of lime. Numerous analyses of the soils have been made, and the results show that the amount of lime seldom exceeds .1 per cent. Many wine farmers have adopted a system of manuring by which they supply the soil with this necessary ingredient, and their method has always been rewarded with excellent results.

As a rule the vineyards in the coast districts are not irrigated, and this must be attributed to another important constituent of

the granite soils, the ferruginous clay, which possesses a most peculiar power of retaining moisture, whereas the porous sandy soils, or the loose calcareous soils of the inland districts, readily part with the moisture they contain, and therefore soils require irrigation. The rainfall in the coast is much greater than in the inland districts, and the maximum rainfall is during the winter months, a circumstance most favourable to viticulture, as the crops ripening in summer, never suffer from rain.

The great difference in the rainfall between the coast and inland districts is not the only cause of the different methods of cultivating the vine in these districts. The physical condition and the chemical composition of the soil of the vineyards in the inland districts are most peculiar, and are the cause of the enormous production which the vines yield. A bed of ferruginous marl, the so-called "kalkbank," stretches for miles and miles almost at the same level through the lowlands of the district of Worcester, Robertson, Montagu, Ladismith, and Oudtshoorn. It commences on the Hex River and extends along the Langebergen as far as Cogman's Kloof. The whole belt of land between the Langebergen and Zwarteborgen, from the Koo to Meiring's Poort, is also characterised by the occurrence of this "kalkbank." The ferruginous marl frequently changes into calcareous clay, which readily decomposes, forming a very rich, loose, and deep soil. The value of this soil is, even in the Colony, not sufficiently appreciated, although there cannot be any doubt about the fact that no more fertile soil can be found throughout the length and breadth of South Africa.

The production of the vineyards of the Cape surpasses as to quantity and quality that of any other wine-producing country in the world. This statement will be readily understood and accepted by the reader who pays some attention to the following figures. In the Cape, Stellenbosch, Paarl and Malmesbury districts the average annual yield is $1\frac{1}{2}$ leaguers per 1,000 vines; expressed in continental measures this yield is equal to $86\frac{1}{2}$ hectolitres per 10,000 vines, which are as a rule planted in Europe on 1 hectare of land, a square of which the side is 100 metres. If 1,000 vines yield $1\frac{1}{2}$ leaguers at the Cape, 10,000 vines will yield 15 leaguers; as one leaguer of 127 Imperial gallons is equal to a very little more than $5\frac{3}{4}$ hectolitres, 15 leaguers are equal to $86\frac{1}{2}$ hectolitres, and this quantity is the average yield in the coast districts in the Colony. In the Worcester, Robertson, Montagu and Oudtshoorn districts, the yield is generally 3 leaguers, and even more, per 1,000 vines which corresponds with 173 hectolitres per 10,000 vines. The writer of this knows many farmers in the Worcester, Montagu and Ladismith districts, who year after year

obtain as much as 5 leaguers from 1,000 vines, which amounts to the fabulous quantity of 287 hectolitres per 10,000 vines. This enormous, and for the European wine farmer, incredible production of the Cape vineyards, is of course a source of wealth to the Colony; but if it be remembered that only a small portion of the area which is suitable for viticulture is under cultivation, it is obvious that no country offers the same chances to intending viticulturists as the Cape. If we compare the gigantic production with the yield of the vineyards in other parts of the world it will become still more evident that the Cape is the wine-producing country *par excellence*.

The following table gives a comparative statement of the production of wine per 10,000 vines, or per 1 hectare, in the chief wine-producing countries in the world. The figures are taken from the standard work on viticulture, by Baron von Babo of Klosterneburg, near Vienna, who is the first authority in Europe on matters referring to viticulture.

Hungary, 1861–1872...	...	...	24	hectolitres per hectare.
Germany ...	...	...	24	" " "
Austria, 1874–1880 ...	...	...	18½	" " "
Switzerland ...	...	...	42	" " "
France, 1873–1883 ...	...	...	18½	" " "
Italy ...	...	...	14½	" " "
Spain ...	...	...	17	" " "
Greece ...	...	...	17½	" " "
Algeria, 1882...	...	...	25½	" " "
United States...	...	...	14½	" " "
Australia ...	...	...	14½	" " "
Cape Colony—Coast districts	...	...	86½	" " "
Inland districts	...	...	173	" " "

As we have stated, the productive power of the vineyards of the Cape greatly exceeds that of any other viticultural country in the world; in no country can there be raised from the same area an amount of wine equal to that raised at the Cape. It is not necessary to say more regarding these figures, they speak for themselves.

Early in 1886 the Phylloxera was discovered in some vineyards of the Cape Peninsula and Stellenbosch district. Measures were taken at once by the Government to retard the progress of this plague, but with little success. The insect spread soon through the vineyards in the vicinity of Stellenbosch, in Bottelary, Jonkershoet, Bankock, Drakenstein, Puiel and Paarl, and there can be no doubt that before long all the vineyards in the Western Province will be affected by the disease.

Under the direction of the Agricultural Department nurseries have now been established in all the wine districts of the Colony for the purpose of raising such varieties of American vines as have been proved to be phylloxera-resisting, namely, *Riparia*, *Rupestris* and *Solonis*. The varieties of the Cape grapes, grafted on these American vines, grow most luxuriantly in the beautiful climate of the Cape, and the quantity of grapes produced by these grafted American vines is much larger than from vines which were planted directly from the cuttings. This important fact has been observed during the last two years, and it opens a bright future for the viticulture of the Colony.



WINE CELLARS, GROOT CONSTANTIA.

CHAPTER XII.

LIVE-STOCK HUSBANDRY.

By D. HUTCHESON, M.R.C.V.S., COLONIAL VETERINARY SURGEON.

THE domestic animals, found in possession of the natives of South Africa, at the date of the discovery of the Cape of Good Hope, by the Portuguese, near the close of the fifteenth century, were cattle, sheep, goats, dogs and common poultry. The ostrich, although existing in great numbers, and roaming all over the country, was not domesticated for profit until fully two centuries after the European occupation of the Cape. There were no horses in any part of the southern angle of the continent, which is very remarkable, considering the early period of the world's history in which they existed in Egypt and Northern Africa, and the fact that South Africa is the native home of three species of zebra, which belong to the equine family.

THE CAPE HORSE.

Horses were first introduced to the Cape by the Dutch East India Company, in the early days of the settlement. They were brought originally from Java, and are said to have been a mixture of the Barb and Gulf Arab. Only a very few breeding animals were originally imported, for we read that at the end of seven years the stud numbered not more than twenty, including foals. About that time sixteen more horses arrived from Java, which evidently did well, as six years later (in 1665) the Company had more horses than it required, and held a sale, when sixteen were disposed of at from £4 to £5 apiece.

By 1688—that is, twenty years after the settlement was established—the horses had increased in number to a satisfactory extent, but had deteriorated very much in character and appearance. This is hardly to be wondered at when we consider the limited number of breeding animals originally at the disposal of the Company. Under such circumstances proper selection, or any selection at all, was out of the question, and close in-and-in breeding became a necessity, and intensified the existing defects. In order to improve the breed, the Company imported a number

of Persian Arabs, and subsequently passed an Act prohibiting any one from using a horse under three years of age.

From this date the horses rapidly increased in number until 1719, when horse-sickness appeared for the first time, and carried off a large percentage of them. In 1763 it reappeared in an epizootic form, and carried off no less than 2,500 horses. Since that date the visitations of this equine plague have been more frequent as the industry of horse-breeding has extended north and east from the Cape Peninsula. In some years—fortunately at long intervals—it passes like a wave over the whole colony. For instance, in 1854-55, it is reported that 70,000 horses and mules died from this disease in the Cape Colony alone, and it is estimated that about 20,000 died during the last season, 1891-92.

Such wholesale destruction of a species of animal by a particular enzootic disease, makes it probable that the absence of horses from Southern Africa, until its occupation by Europeans, was mainly due to the presence of this equine scourge, affecting as it does nearly the greater part of its area. But, notwithstanding these heavy losses, it is an interesting fact, and one which clearly demonstrates the suitability of the Cape Colony, in every other respect for profitable horse-breeding, that a shipment of horses was sent to Madras in 1769, only six years after the small colonial stud had been so terribly reduced by the loss of 2,500 horses; and again during 1856-58 no less than 5,482 horses and 104 mules were shipped to Calcutta and Bombay, almost immediately after the horse-sickness of 1855 had carried off 70,000 head.

But to return to the formation of the foundation stock. Eight stud horses were imported from England in 1792—the breed is not stated, but it is most probable that they were of the early English roadster, or half-breed stamp, at that time coming into prominence. They were not thoroughbreds, nor heavy draught horses, as no mention is made of either at that date. The same year five stud horses arrived from Boston, and the following year a number of horses and mares were brought from the New England States. These are said to have been of Spanish, or Eastern blood. Referring to the Cape horse of this period, an anonymous writer to the *Cape Monthly Magazine* says, "Previous to the year 1800, the only breed of horses then found at the Cape were of Eastern importation, chiefly Gulf and Arabs; but in March, 1807, during the French war, two French vessels were captured here, containing some Spanish horses *en route* to Buenos Ayres, for breeding purposes. It is from these that we derive the blue and red roans, so invaluable for their great powers of endurance," and so highly prized by many Cape Colonists to the present day.

Such then is the origin of the Cape horse, and his character at

the date of the English occupation, and for some time after, is represented as that of a strong hardy animal, deficient in size, substance and symmetry, but possessed of great powers of endurance, a quality which he has always maintained.

It was in 1813, however, that the dawn of a new era in horse-breeding commenced at the Cape. In that year Lord Charles Somerset was appointed Governor of the Colony, and soon after his arrival he directed his attention to the improvement of the Cape horse by means of the English thoroughbred. His first importations were "Bustler" and "Bagatelle," a horse and mare, followed soon after by "Tempest," "Bobtail," "Alexander-the-Great," and "Euryalus." These were succeeded by "Cricketer," "Sorcerer," "Merry Andrew," "Lulweyche," "Pompey," "Vanguard," and several mares. These formed the original blood stock of the colony. During the three following decades first-class English thoroughbreds continued to be imported by such enthusiastic breeders and sportsmen as Messrs. Van der Byl, Cloete, Van Breda, Melck, Kotze, T. B. Bayley, Charles Barry, and others. Horse-racing became an established institution; sires from these thoroughbred studs in the Western Province, were purchased by horse-breeders all over the colony, and considerable improvement began to be manifest in the character and appearance of the Cape horse generally.

About 1840, the South African Turf Club was founded, and mainly through its influence the Cape horse is said to have reached the highest stage of perfection which it has yet attained during the period from 1840-1860.

It was during the latter part of that period that the large shipment of horses to India, already mentioned, took place, and which earned for the Cape horse such a high reputation with the Indian authorities. One old Indian officer, in writing of these horses, says: "For a good all-round horse, capable of standing hot and cold weather in the open and keeping his condition through it, recommend me to the stamp of horse that was imported from the Cape during the Mutiny."

Previous to this, several small shipments of Cape horses were sent to India, every one of which was condemned when first presented before the committee which had to pass them. Yet the horses always earned for themselves a high reputation in the service, and well repaid their cost. Quoting from the *Cape Monthly Magazine*, Captain Gall, in his report, January 31st, 1856, says:—"Out of the forty-four Cape horses purchased by the late Colonel Havelock in 1837 (which were disapproved of at first sight), and distributed . . . no fewer than thirty-seven were actually present in the ranks after having done eleven years'

service, although exposed to all weathers throughout the year." Lieut.-Colonel Bower also writes in the same strain. He says:—"The Cape horses purchased by me in 1839 were condemned in such terms as exposed me to the censure of the Court of Directors, yet they earned a reputation for themselves in the service which obliged the Madras Government to make an apology." The same officer purchased 100 Cape horses in 1849, out of which thirteen were rejected and sold privately for about 100 rupees each, yet all did well."

It is very evident, therefore, from these reports that the average Cape horse to be found about the year 1840 did not present the style and appearance of a gentleman of his class when judged by the English standard, but when tested by the maxim that "handsome is as handsome does," there were few that could show a better record.

During the twenty years referred to, no less than ninety thoroughbred horses were imported, for stud purposes, in the Western Province alone. This large accession of English blood must have materially improved the Cape horse in symmetry and style, bringing him more into conformity to the English type; but he still continued deficient in size and substance.

Colonel Apperly, writing in 1859, remarks:—"I have a very high opinion of the present Cape horses, particularly with reference to their fitness for the ranks of the Indian Army. The only complaint is their want of size, caused principally by starving the mares and foals."

There were other causes at work, however, besides this which operated seriously against the proper development of the horse industry. One was the prejudices of many of the breeders themselves. A friend of Mr. Bayley's writes to him thus:—"Never were people so cursed with prejudices as the horse-breeders of the Cape. So long as they confine their attention principally to such trifles as colour, ears, and white marks, so long will they find people ready to supply them with the sweepings of Tattersalls, and thus insure the deterioration of our colonial breed."

This is really what did occur. Speculators who gauged the Colonial weakness entered the market and began importing light, weedy animals with pretty heads, fine necks, and a showy appearance. These, so long as they could be traced in the stud-book, were sure to meet with a ready sale at exorbitant profits.

On the authority of Mr. Graham Cloete (vide *Argus Annual*, 1892), over 500 English thoroughbreds have been imported into South Africa. I do not think that it is an exaggeration to state that not one-half of these importations were horses likely to

benefit the horse stock of the country, while the remainder had exactly the opposite effect.

In order to counteract this tendency to produce weeds by means of such thoroughbreds, some breeders imported a number of Dutch stallions, animals with prominent crests, large quarters, and small middles, but with showy prancing action. Many of the descendants of these importations are still to be seen in the Western Province, and when crossed back to the thoroughbred have a certain showy appearance, and are much admired by some for driving about town. Mr. T. B. Bayley described them as "misshapen brutes, which had injured some of the oldest studs in the Colony;" while another writer says, "The sole purpose which his hammering—wagt een beetje—action can possibly serve, would be to give some old dowager or valetudinarian an airing on the parade."

But in addition to the lack of judgment in the selection of the horses imported, there was another cause which operated powerfully against the proper development of the horse-breeding industry after 1860, viz., the rapid development of other more profitable pastoral pursuits. Merino-wooled sheep-farming was at this time rapidly extending over the whole Colony, and consuming the food formerly reserved for horses, and Angora goat-farming was fast becoming an established industry; while during the same decade the taming and breeding of ostriches were commenced, which, when once successfully established, the industry became an all-absorbing pursuit to thousands of Colonists.

For about two decades, therefore, horse-breeding was comparatively neglected, except by a few of the owners of the old established studs, until about 1882, when the Jockey Club of South Africa was founded. Since that time the interest in racing has greatly increased and extended, while the many valuable stakes offered at the race meetings held under its auspices have had a wholesome effect in tending to improve the breed of horses.

Further, the development of the gold-fields of the Transvaal, the increasing wealth of our commercial communities, and our advanced ideas of comfort and elegance, have produced a growing demand for first-class riding and driving horses at prices which will well repay the breeder.

Recently also a strong effort has been made, both by our own and the Indian Governments, to revive the trade of shipping our surplus horse stock as re-mounts to India. Captain Hamilton, R.A., visited the Colony last year, and purchased 1,100 mules and a sample of our horses for the Indian Government; and I understand that Mr. H. B. Homan, who recently returned from India, where he went in order to ascertain personally the stamp of animal

which is required there, has entered into an agreement to ship a regular supply.

With such encouragement the question arises, What is the best means of improving our horse stock in the direction desired, in order to meet this growing demand?

A strong impression prevails amongst a great many of our Members of Parliament and leading citizens, that the Arab is the most suitable stallion for improving our Cape horses in the direction desired. And as some justification for entertaining such an opinion, it will be readily conceded that the strength, stamina, and power of endurance, so characteristic of the Cape horse, is mainly due to his Eastern origin. Further, it is to its Arab foundation that the English thoroughbred owes its distinction as the finest race of horses in the world. But the success of the Arab in forming the English thoroughbred, has been due to the climate, the feeding, selection, and care bestowed upon his progeny, and the fact that at the time of the introduction of the Arab blood, the English mares were already superior to any to be found elsewhere; whereas here the conditions are entirely different. The success of the Arab in England is quite exceptional; in no other European country or colony have the standard and quality of the modern breeds of racers, hunters, hacks, and carriage horses, been raised by the Arab. The present improvement of these breeds of horses has been effected mainly by a large infusion of English thoroughbred blood.

In support of my contention that the Arab is not the most suitable sire for improving the Cape horse, I might quote the opinions of such men as Colonel Apperly, Mr. T. B. Bayley, and others, who had experience of the results of the Arab cross, both in this Colony and elsewhere. The recommendations of these gentlemen to the Cape horse breeders were: To increase the size and substance of their existing horse stock by crossing their mares with the best description of Hackney or Cleveland stallion, and to maintain the size and character of the breed by importing the best English thoroughbred blood and bone that money can buy; or, as I have recommended elsewhere, first-class hunter stallions almost thoroughbred, having only a dip into a stronger breed to give the requisite substance and power.

It was with the object of carrying out these views that the Cape Government imported twenty-seven Hackney stallions and one big-boned thoroughbred four years ago. Mr. W. H. Struben, about the same time, imported twenty registered Hackney mares and one Hackney stallion. Several Hackney stallions have also been imported by Messrs. McKenzie and Mellish, of Cape Town; J. M. Orpen, Barkley East; French, Queenstown; Franck, Port Eliza-

beth; and I think by one or two others. The results of these importations have been very satisfactory, especially where the mares had a large strain of thoroughbred blood, and due care was taken of the progeny. But unless the mares are better attended to than they generally are, and the foals fed when the natural vegetation fails, it is impossible to raise the standard and quality of our horses by importations of any breed.

The requirements of the Colony for heavy draught horses are being liberally met by Messrs. McKenzie and Mellish, of Cape Town, Mr. Bradfield, of Dordrecht, and others. Mr. McKenzie has been breeding Clydesdales and Shire horses for a number of years, and Mr. Mellish, who commenced some years ago with the heavy Hackney, is now laying the foundation of a stud of the pure-bred Suffolk Punch, and another stud of the pure-bred Cleverlands; while, as already stated, superior thoroughbreds are being imported, since the revival of horse-racing, under the auspices of the South African Turf Club. Altogether, more attention has been given to the improvement of our horse stock during the last ten years than during the twenty years previous. There is every expectation, therefore, that the horse-breeding industry will again take its proper position as one of the principal pastoral pursuits of the Colony.

The last Census returns show that there are 444,147 horses of all classes and ages in the Cape Colony alone, a far greater number than we actually require for our own use; yet good horses are scarce, and the surplus stock is of such a character that we cannot dispose of it. These remain, therefore, and consume the food which would keep better and more profitable animals. No wonder that many colonists look upon horse-sickness as a blessing, instead of a scourge, as it carries off a large number of animals that are not worth preserving. But with an increased demand for farms, necessitating a large reduction in their size, indifferent farming, with stock that is not worth taking care of, cannot any longer be profitably continued.

With the constantly increasing demand for good horses, at a remunerative price, the profits from this industry, under proper management, will compare favourably with those derived from any other pastoral pursuit.

The Colony and adjoining States are peculiarly adapted for horse-breeding, for, with the one exception of horse-sickness, horses are freer from general disease than any other class of stock. And in order to prevent losses from that plague, all that is required is proper shedding during the prevalence of the epidemic, and provision made for supplying them with a little food, which good horses will always pay for, more especially

within the Cape Colony, where the disease only appears at intervals of ten to fifteen years.

Roaring, and diseases of the respiratory organs, so common to horses in Europe, are comparatively rare in this Colony; and navicular disease, that most common cause of lameness in England, is seldom met with. The main reasons for our exemption from these maladies are that our climate is so perfect, that the horses spend nearly the whole of their time in the open air, and are not cooped up in damp, badly ventilated stables. As Fowler says:—"All existing species of the family Equidæ are dwellers in dry, open, and generally elevated plains. None are inhabitants of gloomy forests or reeking marshes. Fresh air, dryness, and light are essential to their well-being." And these requirements are supplied to perfection in the Cape Colony.

MULES.

Mule breeding is carried on to a considerable extent in many districts. According to the last Census returns, there are about 51,000 mules of all ages in the Colony. Comparatively the largest proportion of these are used in the Western Province districts, where almost the whole of the agricultural work is done by them, and the greater portion of the transport service also. They are also largely used in towns and villages by contractors, builders and tradesmen, in Scotch carts, and similar vehicles, both in single and double harness.

As transport animals, in the large and dry Karroo districts, they are simply invaluable, being strong, hardy, comparatively free from disease, and capable of living and thriving on the coarsest and scantiest vegetation.

It is in the Karroo districts where the large majority of the mules are bred, although many of the larger-sized mules are now being raised in other districts. They are much less trouble to rear, and more economical to use than horses. In fact, they rarely receive artificial care or attention of any kind until they are put to work, which is generally when they are about two years of age.

They get very little training, the ordinary plan is simply to inspan the young ones in the centre of a team containing four or six others, and allow them to settle down to the work in their own way. And although the majority of those which are treated in this manner retain a certain semi-timid semi-wild stubborn *mulish* disposition, there are very few that are really vicious amongst them, while under proper care and management they become as docile and tractable as horses.

The hardy character of the Cape mules and the absence of

inherent vice amongst them, are doubtless due to the fact that the Cape horse, their progenitor on the dam side, is distinguished for the same characteristics. Captain Hamilton expressed himself as being highly pleased with the class of mules which he saw here, and stated that they would compare favourably with any that they had in India.

On trial, I have no doubt that the Cape mule will earn for himself as good a character in India as the Cape horse did, and now that the trade of exporting mules to India has been taken in hand by Messrs. Homan and Faure, their character will not suffer by the selections made. A shipment of 250 has recently been despatched by these gentlemen, which will bring credit to the Colony, and, I hope, profit to the shippers. If a regular export trade in these useful animals could be established, an almost unlimited supply could be provided in this colony. I am glad to notice that some splendid Spanish Jackasses have been imported during the last few years, which should produce a superior class of large-sized mules for heavy draught purposes.

ASSES.

With respect to asses, the Census returns show that there are 45,384 of these slow but patient slaves in the Colony. They are bred and used principally in the Karroo districts to the north and north-west, and are used mainly as transport animals by traders and others whose object is not to get over the country rapidly but economically. Spans of twenty or more of these in front of a wagon are frequently met with, slowly winding their way along the main roads in the dry Karroo districts. A few donkeys are used in towns and villages by small tradesmen and costermongers, and a few are elevated to a distinguished position in connection with a fully equipped gentleman's establishment; but his principal lot is that of the poor man's slave—the most economical motor force in the Colony.

CATTLE.

Large herds of cattle were found in possession of the Hottentots of the Cape at the time of its discovery by the Portuguese, and, subsequently, when vessels of the principal maritime nations began to call at Table Bay, they were able to obtain as many cattle as they required, at prices ranging from a piece of hoop iron to a couple of pocket knives.

It would appear from Theal's 'History of South Africa,' that the cattle in possession of the natives living on the East Coast were superior to those found in possession of the natives living on the West Coast and the country to the north. We read that Corporal

Cruse, during his second expedition to the neighbourhood of Mossel Bay, in 1668, encountered a company of Bushmen, who were in possession of a large herd of cattle which they had captured from the Hottentots; these the Corporal re-captured for the Company, after killing and dispersing the Bushmen. These cattle are described as a valuable herd, containing many breeding cows of a superior character, such as it was hardly possible to obtain by barter. These cows would doubtless be carefully preserved and mated with the best bulls then in possession of the Company, and thus become the foundation stock from which the modern Cape cattle are derived.

The Hottentot ox is described as a gaunt, bony creature, with immense horns and long legs, but hardy, and well adapted to the wants of his owner. This description, in my opinion, represents more particularly the character and appearance of the cattle which were brought down from the dry districts situated to the north and west of the Cape Peninsula, as it corresponds somewhat with the character and appearance of the native cattle in Namaqualand and Damaraland at the present day. The cattle found on the eastern coast, where the vegetation was more luxuriant, were evidently superior to these; and if it is borne in mind that it has been principally by means of the native ox that the early Dutch pioneers explored the Cape Colony, and their descendants, the Trek Boers, opened up the States and territories to the north, before there were any tracks even, let alone roads and bridges, it will be admitted that the severe labour which these oxen had to undergo, dragging heavy wagon-loads over rugged mountains and through deep gorges, could not have been performed by gaunt, bony animals such as the above description portrays.

It is quite possible that numbers of these oxen were drawn a little fine by training, for the natives not only used them as pack-oxen and racing-oxen, but they actually trained them as war-oxen to charge the enemy, without either guide or rider, their movements being controlled by certain calls or words of command. The natives, both Hottentots and Kafirs, are very fond of their cattle, and the latter especially exhibit great skill in their management. A Kafir ox-race is a very exciting form of entertainment. The riders are clad in nature's garb, without saddles or such like modern racing appointments, all the equipments required being a small stick pierced through the cartilage dividing the ox's nostrils, with a rope, or riem (strip of ox-hide) tied to each end for bridle reins, by which he is guided, while he is goaded on to his utmost speed by the liberal use of a good-sized kerrie.

But it is as a draught animal that the Cape ox appears to the best advantage. In that capacity he has few equals and no superiors. In shape and general character he is quite different from any of the modern European breeds of cattle, and is specially adapted for draught purposes. He has a strong, proportionately heavy forequarter, with a large development of the muscles of the upper part of the neck and withers for holding the yoke; a close, compact body, light and drooping hindquarters, and splendid legs and feet for travelling. When in good condition, he presents a certain symmetry and beauty of form which is much admired. One of the finest teams of draught oxen that I ever saw was a team of pure bred Africanders, as they are called. They belonged to Mr. Wm. Schoeman, of the Cradock district, and were awarded the first prize at the Agricultural Show held there in 1891. They were dark red in colour, similar to the Devon, with scarcely a speck of white on one of them, and so uniform in size and shape that it would have been difficult to distinguish the one from the other separately.

As the ox-wagon was the principal mode of conveyance for passengers, as well as for goods, for nearly two centuries after the occupation of the Cape by the Dutch, the early stock-farmers took a great pride in possessing spans, or teams, of oxen as nearly alike in colour and appearance as possible. This naturally led to selection by means of the colour test, and as the dark red would appear to have been the favourite colour, the pure-bred Africander cattle at present found in possession of many of the Dutch farmers in the Cape Colony and adjoining States, are nearly all of varying shades of red in colour.

The native cattle in Namaqualand and Damaraland, and those in possession of the natives in some of the Colonial territories, are red and white, the red colour largely predominating, and that would appear to have been the colour of the original cattle found at the Cape; but by selection the white has been largely bred out.

Those pure-bred Africander cattle retain their wild character, and become very dangerous when excited or disturbed in any way. Under such circumstances they will charge human beings just as a buffalo would. This is not due to any innate untamable disposition, but simply because the cows, not being very large milkers, are not milked by hand, but allowed to run with their calves undisturbed; hence their wild character has been intensified, rather than diminished, under European treatment. When owned by natives, or handled and attended to properly by Europeans, they become tolerably quiet and tractable, although it would, doubtless, take a few generations of attention to make them as docile as the modern European breeds.

The cows when milked by hand will only give up their milk to the milker in the presence of their calf. The plan adopted is as follows: the calves are kept separate from the cows and are driven into a separate kraal, adjoining the kraal in which the cows are placed. When the milker comes he calls to the boy in charge of the calves to let a certain calf out, which as soon as it escapes through the gate runs straight for its mother, and commences to suck. The cow stands then and allows the milker to fasten her hind legs together with a riem, after which he knocks the calf away from the udder, and commences to milk, drawing off as much as he considers sufficient, leaving the calf to drain the udder dry. The same process is repeated with the others. If the calf of one of these cows happens to die, the cow refuses to give up her milk to the milker, and very soon becomes dry. A stratagem to deceive such a cow is often tried, and frequently succeeds. It consists in skinning the dead calf and stuffing the skin with straw. The milker brings this stuffed calf and lays it alongside of the mother, who smells it and is comforted, and commences to let down her milk to him.

Another habit of these cows, when they calve out on the veld, is to hide their calves in some bush or sheltered spot, so that they may not be seen. And it is astonishing how strong the wild instinct is in these calves, for they will lie for a week or more in perfect concealment. Of course, if the calf is not found, the cow cannot be milked—hence every effort is made to discover its hiding-place. The usual plan is to keep the cow in the kraal for twenty-four hours, and then to watch where she goes, being careful not to let the cow see that you are following her.

As to the primary origin of the cattle found in South Africa, it is most probable that they were brought south by the native races—the Hottentots and Kafirs—who are believed to have come at a remote period from some part of Northern Africa. They bear a very strong resemblance to the cattle of Spain and Portugal, but that may simply be because the cattle found in these two countries are the remaining representatives of the original cattle of most European countries, before the modern breeds were formed.

Be that as it may, the Dutch Company made early efforts to improve the native breed of cattle at the Cape by importations from Holland, the New England States of America, and from Great Britain. The character of the cattle, or a description of the animals imported, is not given, but it is most probable, from the close connection of the Company with Holland, that, with the exception of those which were imported from Britain, the majority of the others would be of the improved Dutch breed, now known

as the Holstein or Friesland—more especially as that is one of the oldest-established of modern breeds of cattle. Professor Overman states that the modern Friesland breed of cattle has been in existence for about 2,000 years, and that it has been from it that the majority of the modern improved European dairy cattle have been derived.

There is little doubt that the foundation stock of the improved breed of cattle formed at the Cape were Frieslands. What is known as the Cape cow—that is, a cow bred in the Cape Peninsula—is dominantly Friesland still—that is to say, there are strongly marked Friesland characteristics about the large majority of them.

The Cape cow had evidently greatly improved in milking qualities during the first century of the Dutch occupation, for Theal informs us that an average of 22,322 pounds of butter were exported to India for a period of eighteen years, commencing in 1754.

The breed has, during the present century, been largely crossed with the Kerry, the Alderney or Jersey, and the Ayrshire breeds, and the characters of each of these breeds can be observed in the Cape cow, the one or the other preponderating, depending upon the impressiveness of the last sire or the repetition of the same cross.

Although of a very mixed breed, the Cape cow has established an excellent reputation as a good milker. In fact, that has been the only selection test which has been carried out; and it is really the best selection test for the establishment of dairy cattle that can be adopted.

Since the formation of stud-books and pedigree stock there is too great a tendency to stick to pure strains, and to breed from all pedigree animals, whether they are worthy representatives of the breed or not; hence many half-bred cows are superior to many pure-bred cows in milking qualities. The Cape cow is a good example of this fact, and it is really surprising to see the quantity of milk which some of these big-little cows yield from the small quantity of food which they require.

Four and a half to five gallons of milk a day is quite a common yield for these cows to keep up for months, when properly fed. Large numbers of these Cape cows have been sent to all parts of South Africa, at prices ranging from £15 to £25 apiece, and picked ones at much higher figures.

Besides this composite breed, as it may be termed, there are a number of pure-bred herds of Friesland cattle in the Cape Peninsula, and a greater number that are dominantly Friesland throughout the Western Province; that is, herds in which nothing

but pure-bred Friesland bulls have been used for a number of years. This breed is undoubtedly the favourite with the Dutch farmers. The prominent breeders of pure Friesland cattle in the Cape Peninsula are Dr. Landsberg, Messrs. F. Mellish, G. Gie, &c.; while to the Honourable Mr. J. H. Hofmeyr, late Member of the Legislative Council, is due the credit of importing a large number of the finest animals of this breed that have been introduced into this Colony.

There are also a few very fine small herds of pure-bred Alderney or Jersey cows near Cape Town, the principal amongst these being the herds belonging to Messrs. Adrian Van der Byl, W. Hertzog, Lind, Purcel, Dr. Meyer, &c. The late Dr. Hiddingh had a very fine herd, which was dispersed at his death. A few years ago, Mr. Rawbone of Sir Lowry's Pass laid the foundation of a herd of pure-bred Ayrshires, which are doing well. There have been a number of pure-bred Kerry bulls imported, but I do not know of any one who has established a pure-bred herd of these. They are used principally to cross with the larger breeds, to give compactness and hardiness, and to improve the quality of the milk.

In the Eastern Province of the Colony, more particularly in the sweet grass-veld districts, the Shorthorn is the most popular breed of cattle, especially with the English farmers; and where the conditions are favourable, and there is an abundance of food, this breed thrives and grows out well, giving the best average returns to the farmer where milk and beef are both considered.

The exhibit of short-horned cattle shown at the Port Elizabeth Agricultural Show of 1891 was a credit to the Eastern Province, and would not have disgraced some provincial shows in England. The leading breeders of Shorthorns in the Eastern Province are Messrs. G. King and Sons and W. H. Hockley, of Bedford, D. Watson, of Victoria East, Quale Dickson, of Fort Beaufort, G. Pirrie, of Richmond, C. Southey, H. W. Struben, and M. Hall, of Middelburg, and G. Paton, of Barkly West; and there are many others whose herds are dominantly Shorthorn, although not perhaps pure-bred on both sides.

There are three herds of pure Hereford cattle also in the Eastern Province, belonging to Messrs. Sutherland, Thomas River, Pope, of Adelaide, and the Grewar Estate near Kimberley. The latter has only been established a few years, but all are doing well, and promise to be a success. The Hereford's aptitude for putting on flesh and of maintaining its condition, even when the food is not over abundant, makes it a very suitable breed for many parts of the Colony.

Mr. William Southey, of Middelburg, has also established a

very fine herd of pure-bred Devon cattle, and the Grewar Estate has also laid the foundation of a small herd of the same breed.

This compact, hardy breed of cattle is peculiarly adapted for our dry Karroo districts, where it is able to maintain its size and condition, and makes an excellent cross with the Africander cattle.

Mr. Leppan, of Upper Albany, is the only breeder of pure Ayrshire cattle that I know of in the Eastern Province, and Mr. Boysen, of Graaff Reinet, the only breeder of pure Jerseys; but there are many individual pure-bred animals of both breeds scattered throughout the Province, and a greater number of herds that have a large infusion of the blood of these dairy breeds.

The Friesland cattle are now largely represented in the Eastern Province, and have been fast gaining in popularity during the last ten years. Previous to that period, Messrs. H. B. Christian, of Port Elizabeth, F. Wienand, and William Fuller, of Bedford, and I. Vermaak, of Albert, were almost the only breeders of pure-bred Friesland cattle in the Eastern Province, while at the present time there are scores of farmers breeding these cattle with very satisfactory results.

The exhibit of Friesland cattle at the Port Elizabeth Agricultural Show in April of this year was the largest and best that has ever been seen together before in the Colony; and some very superior bulls of the breed have been imported into the Colony since that date. The Friesland cattle are undoubtedly the most widely popular dairy breed with Cape Colonists at the present time.

But, notwithstanding the rapid dissemination of these improved modern breeds, the large majority of the cattle, more particularly those found in the dry Karroo districts to the North and North-West of the Colony, are still mainly of the Africander breed. On many of the old-established farms in these districts, however, there are herds of these cattle to be met with, which in colour and general appearance look very like pure-bred Africanders, but a closer inspection reveals the fact that they have been greatly improved, at some previous date, in milking and other qualities, by a cross with some cattle of a good milking strain; most probably with the Cape cattle from the Peninsula. The improvement has then been perpetuated by selection, until they may now be considered an improved Africander breed.

These cattle have all the hardy characteristics of the pure-bred Africander, and are thoroughly acclimatised to the dry and scanty vegetation of the Karroo; they are very docile, from being constantly handled and milked, they rear their calves well, maintain their condition, and supply the household with milk and butter,

where it is doubtful if any of the modern breeds of dairy cattle could exist without artificial feeding. In fact, the existence of such an improved breed of cattle in these dry Karroo districts is an object lesson in the art of breeding, clearly demonstrating that in the formation and establishment of any particular breed of farm animals, primary consideration must be given to the question, whether the food supply and general surrounding conditions are capable of maintaining the character and quality of such a breed unimpaired and at a profit to the farmer.

The day will come, and the sooner it arrives the better, when each distinctly different section of the Colony will have its own particular types or breeds of farm animals, corresponding to the capabilities of its soil, vegetation, and general climatic conditions. The stock-farmers are beginning to realize this fact, and are studying to form their respective breeds in accordance with it.

The census of 1891 shows that there are 2,210,834 cattle of all ages and classes in the Cape Colony, including its native territories; these numbers could be very largely increased, and the returns from them more than doubled, if shelter were provided for stock during the winter, and a supply of food preserved to support them when the natural vegetation fails. Of course, improved methods of farming naturally and necessarily lead to improved character and quality of stock, with increased profit and pleasure in conducting farming operations.

DAIRY-FARMING.

It is noticeable that a great improvement has been effected in the different breeds of cattle during the last twenty years. This has been mainly due to the discovery of the diamond fields and the rapid extension of the railway system to that busy centre. Previous to the construction and extension of our railways, the transport of the whole of the goods traffic of the Colony was carried on by means of the ox-wagon; consequently cattle were bred principally for draught and slaughter purposes. Superior milking qualities were of secondary importance, except in the neighbourhood of towns and villages, as there was no means of disposing of the surplus dairy produce after the local demand was supplied. During the summer months when food was abundant, the local markets were glutted with butter, selling at a few pence a pound, while at other times the supply would fall far short of local requirements, and rise to as much as four and five shillings a pound.

With the extension and connexion of the different systems of railway all this has been changed. Butter can now be sent to the principal business centres from all parts of the Colony, approached

by the railways, thereby equalizing the price, and greatly increasing the local demand; while the amount of butter imported during the last ten years has been reduced by more than one half. There is also a constantly increasing number of our large dairy farmers devoting their attention to cheese-making—some excellent colonial-made cheese, Cheddar and Stilton, being now regularly supplied to our local markets.

The extension of our railways has also had the effect of dispensing with the services of tens of thousands of draught oxen; hence the farmer now wants to breed an ox which will come to maturity at three or four years old, instead of having to keep him six or eight years, as formerly, before he is fit for the butcher. These are the main influences which have led to a more rapid improvement in our breeds of cattle during the last twenty years, than at any previous period of the century.

But much still remains to be done before our dairy industry takes the position which it ought to occupy. Fortunately, we have the example and the experience of the Australian Colonies to guide us in this matter. It is only a few years since the dairy industry of the Australian Colonies was in the same unsatisfactory condition that the dairy industry of the Cape Colony is in at the present time. This unsatisfactory state of matters has been successfully overcome by the Australian colonists, by the introduction of cream separators, the adoption of the most approved methods of manufacturing dairy produce, giving greater attention to the selection of dairy cows, and making provision for feeding them when the natural vegetation fails. This has been done mainly by means of ensilage, which is considered the best and most economical plan of feeding dairy cows. But the greatest stimulus to the development of the dairy industry, especially in the Victorian Colony, has been the action of the Government in offering large bonuses for the establishment of creameries and butter factories, and for butter exported to England; at the same time a travelling dairy was fitted up with all the appliances necessary for making butter and cheese on the most approved principles. This was placed under the management of a dairy expert, who travelled round the Colony, visiting the towns, villages, and dairy centres, where arrangements could be made for the supply of a sufficient quantity of milk. At each of these places he made butter and cheese and demonstrated the uses of the various appliances, etc.

These measures were only commenced in 1888, and the rapid development of the dairy industry since that date has been little short of marvellous. In addition to doubling the local demand, on account of the superior quality of the butter manufactured,

400 tons of butter were exported to England in 1889-90; 1,000 tons in 1890-91; and over 2,000 tons in 1891-92, and they expect to export 3,000 tons during the present season; while the prices realised are sufficient to satisfy the producer, pay the exporter, and at the same time please the consumer.

The Cape Colony is much more favourably situated than the Australian colonies for exporting butter to England, the distance is much less, and it possesses greater shipping facilities. All that is required is co-operation on the part of the dairy farmers for the establishment of creameries and butter factories at suitable situations along the railway routes. These schemes the present Cape Government is prepared to foster on the same lines as they have been so successfully carried out in Victoria. Courses of dairy instruction have been given at the Agricultural School of Stellenbosch by Professor Bliersch for the last three years, and more recently at the Somerset East Agricultural School by Professor Overman; while during the same period Messrs. Macdonald and Hellier have been travelling through the eastern and midland districts, giving practical instruction on the same and kindred subjects. Further, Government has fitted out travelling dairies—one for the Eastern Province and one for the Western Province—and Mr. MacDonald, the Agricultural Assistant at Graham's Town, lately visited Europe with the view of obtaining the most modern dairy appliances for that purpose, and at the same time acquiring a thorough knowledge of the most approved methods of manufacturing dairy produce. Cream separators are now being largely used throughout the Colony, and one successful butter factory has been established at Daggaboer's Nek in the Bedford district.

It is impossible to develop the export trade unless butter factories are established, because in no other way can first-class butter of uniform quality be produced in sufficient quantity for shipment, and without an export trade the dairying industry cannot be successfully prosecuted. The surplus butter in times of abundance must be got rid of, in order to maintain the local price at a figure which will pay the producer. Further, experience shows that these creameries and butter factories must be established on the co-operative principle—the contributors of milk must be shareholders. Proprietary factories have invariably failed. As Mr. Wilson, the dairy expert for the Government of Victoria, says, "It is from the superior produce of the factory that we are to increase the local consumption four-fold, and it is from the factory butter alone that we are to create an unlimited trade in the British market." It is sincerely to be hoped therefore that the action of the

Cape Government will find a ready response from the cattle farmers of the Colony, and that within a very few years they will have removed the blot from it of being a large importer of butter, and have in addition established a large export trade in the British market.

THE CAPE GOAT.

The common goat was found in possession of the natives of the Cape at the date of its first occupation by Europeans. It would appear, however, that the Hottentot tribes living near to the Cape Peninsula kept very few, if any, as no mention is made of them until the census returns of 1691, when 220 are stated to be in possession of the Colonists. After that date, whether by accession from the natives' flocks or by the process of natural multiplication, the numbers of common goats increased very rapidly, until checked somewhat by the introduction of Merino sheep, and at a later period by the commencement of Angora goat-farming. According to the last census returns there are at present nearly $3\frac{1}{2}$ millions of common goats in the Cape Colony and its native territories. They are farmed with principally in the dry Karroo districts to the north and north-west of the Colony, in the native territories, in many of the coast districts, and in the bush country where sheep do not thrive. In the agricultural districts also they are largely raised as a source of cheap food for the servants. They also form a considerable portion of the stock of poor farmers, both European and native, in all the districts of the Colony. They are also a necessary adjunct to all sheep farms, where they perform the function, in great part, of sheep dogs, only, instead of driving the flocks, they lead them. When a flock of sheep require to be kraaled, or penned, for any purpose, a couple of kapaters (castrated male goats) are employed to lead the flock into these enclosures, which they do very efficiently, walking in front with a stately, dignified gait, as if conscious of the important duty which they are discharging; the sheep crowd in at the gate immediately behind them. It is hardly possible to estimate the saving of both time and temper which a few well-trained common goats will effect on a large sheep farm at times of shearing, dipping, dosing, or dressing, when portions of the flocks of sheep require to be led in succession into a small and strange enclosure to be caught, while their services in leading flocks of sheep which have to travel long distances through the Colony, crossing rivers, &c., are simply indispensable. I have seen two such leading kapaters, or "voorloopers," as they are called, take a large flock of sheep through a good-sized river in sections of one hundred or more at

a time. The plan adopted was for one man to stand on each side of the drift. The goats were launched into the river, with as many of the sheep as could be got to follow them. As soon as the goats reached the other side, the man standing there caught them and held them until the sheep swimming after them had reached *terra firma*; he then turned the goats' heads to the river, which they immediately re-crossed, to be caught again and re-launched with another consignment of the flock; and this was repeated until the whole flock, numbering about 2,000 sheep, were safely led across the river.

The common goats are very hardy animals, grow to a large size, and multiply very rapidly; hence they are about the most profitable stock which a farmer can raise in districts where there is a demand for their mutton. For a poor farmer who has only a small flock of sheep, the common goat is the most economical slaughter animal for his household consumption. Their mutton is a little stronger and coarser than that of the sheep, or even the Angora goat; but when properly prepared, it is wholesome and palatable. During a long drought in some of the dry Karroo districts, they are often the only kind of stock in a condition fit for the butcher.

The original goat found in possession of the natives was a very inferior animal to the common goat of the country at the present time. The improvement in size and appearance has been effected by repeated importations of superior goats of the common varieties from Europe.

THE ANGORA GOAT.

The introduction of the fine-haired varieties of goat into this Colony was beset with more than ordinary difficulties and misfortunes, as the following brief history will show.

In 1725, the Dutch Company made an effort to establish a breed of the Cashmere variety of goats in the Colony. Twenty-four Persian goats were obtained and sent to Ceylon, whence they were conveyed to the Colony. Eight only of these arrived at the Cape, the others died on the way. Of these eight only one was a she-goat, and she unfortunately died soon after being landed. The he-goats remaining were then crossed with the native she-goats, and the female progeny of these cross-mated again with the imported sires. Tolerably good hair was obtained from this second cross; but the imported rams died, and no others being introduced, the breed for want of careful selection began to deteriorate, the hair became of little value, and the industry had to be abandoned.

No further effort to introduce a fine-haired breed of goats into

the Colony appears to have been made until 1835. Some time previous to this Mr. Riley of New South Wales, imported into that Colony a few Cashmere goats from France, and in 1835 he exported three of these to the Cape of Good Hope. They consisted of one pure-bred ram and ewe and a half-bred ewe. They were purchased by Mr. Korsten of Port Elizabeth, but they are reported to have died of scurvy before any progeny was got from them. Three years later—1838—Colonel Henderson of Bombay, obtained twelve pure-bred Angora rams and one ewe, which he brought by a very circuitous route, and at great expense, to the Cape (they are supposed to have come by Bussorah and Bombay). Six rams died on the journey, and it was discovered that the other six had been rendered impotent by some operation before being exported. At any rate, only one male, which was born on the passage, proved perfect, and capable of propagating his species.

Mr. F. W. Reitz says, "Colonel Henderson did not communicate the particulars of his loss or expense to any one publicly;" and this is hardly to be wondered at, considering what his disappointment must have been at the result, after all his trouble and expense.

Colonel Henderson introduced these goats into the Caledon District. He there selected pure white native goat ewes and crossed them with the pure-bred Angora ram, and the trial proved a success. The female progeny from this cross were again mated with their sire, and this process was repeated as long as the ram lived, which was fortunately to a good old age.

The stock thus formed by careful selection of the ewes, and close in-breeding to the one ram, became wonderfully fine, and were kept pure and distinct for a number of years in that district, first by Colonel Henderson, then in succession by Mr. de Vos of Caledon, and Messrs. Franz van Aardt and Hopley of Swellendam.

Meantime young rams from this select flock were purchased as stud rams for crossing with selected common goat-ewes, by farmers in the Caledon and surrounding districts, so that in a few years there were a large number of cross-bred Angora flocks.

Mr. Mosenthal, writing in 1857, says, "The stock from this flock found their way to Caledon, Swellendam, to Bokkeveld, and Roggeveld, Beaufort West, the Swart Ruggens, Camdeboo, Rhenosterberg, and Winterveld. A Mr. Sinclair, who lived between Richmond and Hope Town, had a flock numbering over 600, but their hair was very coarse."

Observing the manifest improvement which this cross effected, the Agricultural Society of Swellendam resolved to make en-

quiries with a view to the introduction of some fresh blood, and £1,200 were subscribed by those interested for that purpose, but after a lengthened correspondence with every one likely to give information on the subject, the difficulties appeared insurmountable; the project was abandoned, and the money returned to the subscribers.

Messrs. Mosenthal Brothers then took the matter up. They first communicated with Lord Derby, as he had some in his menagerie, but the information obtained revealed such difficulties that the idea was abandoned for a while. They then communicated with the Indian authorities, but the information received was, that the difficulties of getting them across the Himalaya Mountains were very great. They then tried to procure the goats from Persia or Asia Minor, but remained unsuccessful. A London firm was then requested to write to Beyrout, but they wrote to Bavaria. It was then decided to go in person and bring the goats, and Mr. Adolph Mosenthal proceeded to the Orient for that purpose, and after much trouble, great personal inconvenience, and expense, he succeeded in landing thirty rams and ewes in the Colony in 1856. These were taken to Graaff Reinets and sold at an average price of £82 per head. Although the particulars are not stated, it is reported that a considerable number of Messrs. Mosenthal's importation died on the way. This importation of Messrs. Mosenthal Brothers were, therefore, the foundation stock of the pure-bred Angora goats of the Midland and Eastern districts of the Colony.

The following year the Honble. Dr. White, now of Cape Town, obtained a number of pure-bred Angora rams and ewes through Sir Titus Salt. This shipment arrived at the Cape about December, 1857, and were located in the Swellendam district, and became the foundation stock of the pure-bred Angora goats of the Western Province. A year or two after this Mr. Ziervogel, of Graaff Reinets, purchased some rams from this pure-bred flock of the Honble. Dr. White's, and took them up to the Graaff Reinets district. It may be mentioned in this connection also that the Honble. Dr. White, subsequent to his importation of the Angoras, obtained a pair of Alpacas, a male and female; the latter gave birth to a lamb, but the male parent, either in the exuberance of his joy at becoming a father, or more probably being jealous of the lamb for having usurped his place in the affection of its mother, killed it. Some time after this the female died, she being much older than the male, and the latter becoming distracted at the loss of his partner, wandered away, and was found drowned in an adjoining river. Thus ended that industry.

About 1867, Messrs. Stewart and Company, of Port Elizabeth,

received a consignment of Angora goats, which were distributed mainly about Mount Stewart and adjoining districts.

No further importations of Angora goats were made until 1879, when the late Mr. J. B. Evans, of Rietfontein, visited the Angora districts of Asia Minor, and obtained a large number of pure-bred Angora goats which were landed at Port Elizabeth in December of that year. The following year, other three lots were imported by Messrs. Holland and Co., of Port Elizabeth, Messrs. David and Co., of Somerset East, and Mr. Evans. There were some goats in these latter importations, which were not considered to be of very excellent quality, and grave doubts were expressed respecting their purity of descent; but the large majority realized high prices, ranging from £100 to £400 apiece. They were sold at Port Elizabeth, Somerset East, and Graaff Reinet, respectively. A small number which were held over from Messrs. Holland and Co.'s sale were sold at the late Mr. Frank Holland's sale of stock at Adelaide in April, 1881, but did not average very high prices. These three lots of Angoras were purchased, principally, by the breeders of Graaff Reinet, Aberdeen, Jansenville, Somerset East, Bedford, and Fort Beaufort. No further importations of Angora goats have been made since that date.

During the thirty-five years that Angora goat farming has been established, the extension of the industry has been very satisfactory. According to the last census returns, there are now 3,184,018 Angora goats in the Colony. It must be understood, however, that only a comparatively small number of these are of pure descent; the great majority have been necessarily derived from the common goat ewes of the Colony, repeatedly crossed with more or less pure-bred Angora rams.

Further, it must be admitted, that there are many Angora goat farmers who do not realize the importance of breeding from pure-bred rams only; hence there has not been that uniform improvement in the quality of Cape mohair which might have been expected during a period of thirty-five years. There are, fortunately for the credit of the Colony, a large number of Angora farmers who are fully alive to the necessity of constantly grading up their stock with pure-bred rams, and these of the best which can be procured. The success which has attended the enterprise and skill of such breeders, has abundantly shown that mohair can be grown in many parts of the Cape Colony as perfect in quality, and as beautiful in lustre, as any mohair produced in Angora itself.

It must be noted, however, that the same superior quality of mohair cannot be grown in every district of the Colony, any more than it can be grown in every district of Asia Minor. It is a

well-recognised fact that the very finest and brightest Turkey mohair can only be produced in that part of Asia Minor situated within a limited circle of Angora and Beibazar. Outside of that circle the mohair deteriorates in fineness and lustre, although the goats may increase in size and the fleeces in weight. The same variation in quality is being recognised in this Colony. There are three distinct types or varieties of the Angora goat here, distinguished as (a) the fine, lustrous, silky-fleeced goat, producing the most valuable hair, but an animal of comparatively small size, with only a moderate weight of fleece, as a rule; (b) the long, heavy-haired goat, having a very heavy fleece, but hair rather strong; and (c) the so-called oily goat. This variety of goat secretes a sort of sebaceous secretion from the skin which, on the hair, presents a greasy appearance, but there is very little, if any, fat in it. This goat produces a heavy, profitable fleece, and is preferred by some breeders. The manner in which these different types of Angora goats were originally formed, is generally represented to have been by means of a cross between the black Kurd goat common to the whole of Asia Minor and the pure bred silky-fleeced goat of Angora and surrounding districts. The distinct characters of these crosses have been perpetuated and intensified by the dissimilarity of the climate, soil, and vegetation of the different districts where the Angora goat is now raised, both in Asia Minor and in Cape Colony. The same modifying influences are now fully recognised in sheep breeding, and, in fact, in stock breeding generally. Every breeder's main study should, therefore, be to find out the particular class or type of animal which is best adapted to the particular conditions of his own locality, and which promises to give him the most profitable return.

The main hindrance to the successful development of the merino wool and mohair industries in the Cape Colony is the fact that the foundation stock of both industries were respectively the hairy, fat-tailed native sheep and the coarse, common-bred native goat. It takes a number of generations of careful breeding to eliminate the plebeian origin, and when that care is not exercised it is never eliminated.



CHAPTER XIII.

OSTRICH FARMING.

BY ARTHUR DOUGLASS, M.L.A.

FROM the earliest period, whether amongst barbaric or civilised nations, the downy plumes of the ostrich have been highly prized as one of the most beautiful of feathers. Not only were they valued by fair dames, but even "warrior knights, and men of high degree," esteemed them as trappings for their horses, their armour, and their persons,

"When white-plumed steeds and riders bold
Thronged in their rich and proud array."

By the English nation they have been specially prized from the time that the Black Prince at the battle of Crecy, in 1346, having slain the king of Bohemia, plucked the plume of ostrich feathers from the deceased king's helmet, and placing it in his own, assumed it as the crest of the Prince of Wales, which it has ever since remained. In those days, the feather could be obtained only from wild birds in Northern Africa; but after the colonization of South Africa, the ostrich was found to inhabit nearly the whole of the continent, and is found in no other part of the world.

From the extreme shyness and great swiftness of foot of the ostrich, the export of feathers from both North and South Africa

remained on a small scale; and the article being in such limited supply, could not come into that general use as a ladies' head ornament, or for dress trimming, which of late years it has become, and for which purposes its intrinsic beauty must always ensure it a pre-eminent position. It is only since the domestication of the bird, and the consequently large increase of the production of ostrich feathers, that we find it a staple article of commerce.

The domestication and farming of the ostrich began in and has hitherto been confined to the Colony of the Cape of Good Hope. Up to 1860, it was commonly thought that the day was not far distant when the ostrich would be numbered amongst the extinct animals of the world. Eager, indiscriminating hunters, both European and native, found the chase of the wild bird an exciting and profitable sport. They killed them for their feathers at all times of the year, without any regard to the breeding seasons; an ordinary way of destroying them being to watch the male birds with fine plumage at their nests and then to take advantage of them while sitting on the eggs and steal up near enough to shoot them. As this process of extermination went on, the wild birds were scared away from their old haunts into the desert interior, and the poet Pringle describes how

"The fleet-footed ostrich over the waste
Speeds like a horseman who travels in haste,
Hieing away to the home of her rest
Where she and her mate have scooped their nest,
Far hid from the pitiless plunderer's view,
In the pathless depths of the parched Karroo."

But all this was to be changed. Instead of the fair dames of the Court and society being adorned with the snowy plumes at the cost of the destruction of these noble birds, a new industry was to be given to the world, another animal added to our domesticated list, and new life and vigour thrown into our farming population at the Cape; an industry that would cause large tracts of country to be fenced in, that would give the more intelligent and enterprising of our farmers an opportunity to rise to the surface, and would bear fruit in a hundred ways, by inducing men to look round and search in other directions for the latent wealth that lies in South Africa, only wanting development.

Between 1857 and 1864 a few farmers in different parts of the Colony had succeeded in capturing some wild ostrich chicks, and it was found there was no difficulty in getting them moderately tame, sufficiently so to permit of their enclosure in a well-fenced paddock, and to allow of their being caught twice a year and their feathers removed. Old hunters and travellers from the

interior, all prognosticated that any attempts to breed them in a tame state would prove abortive, it being commonly said that so shy was the ostrich, that if the nest was once seen by man, the bird would never return to it. But this and many other difficulties in the successful domestication of the ostrich were to be solved in a manner then never dreamt of, and a foundation laid to a complete change in the nature of the bird, and from being the shyest and most timid of all birds, to make it in a few years as tame and as easily farmed as any of our domesticated animals.

In 1865 we have the first record of the tamed but not yet domesticated ostrich being farmed. In the census of the Cape Colony taken in that year, we find in the return of live stock in the Colony eighty ostriches. The total export of ostrich feathers in that year was 17,522 lbs. weight, valued at £65,736, these being feathers entirely from wild birds, with the exception of 120 lbs. weight from the above noticed eighty tame birds. At about this amount the export remained, little progress being made in the domestication of the birds, till in 1869 Mr. A. Douglass, of Hatherton, in Albany, succeeded in perfecting an incubator and hatching the eggs in large numbers, thus solving what had hitherto been the great difficulty to successful ostrich farming. Previous to this, the few birds that were hatched, generally got wild and unmanageable, but the successful development of artificial hatching at once gave an impetus to the industry, and the export of feathers the following year rose to 28,786 lbs., valued at £91,229.

The industry was now fairly started, artificial hatching entailing artificial rearing; this again caused a close study of the wants of the birds, and the knowledge thus acquired enabled those farmers who did not hatch artificially to remove the chicks from the parent birds as soon as hatched, and rear them by hand. Thus they became rapidly free from the innate wildness that had hitherto been the great drawback to successfully farming them, each succeeding generation showing more and more signs of perfect domestication. The result was that in 1875, five years later, the export had risen to 49,569 lbs. weight, valued at £304,933. In this year (1875) a census was taken of the Cape Colony, the return of live stock showing 21,751 domesticated ostriches, as against eighty at the beginning of the decade.

The next five years saw the production of feathers rise rapidly, the export in 1880 being 163,065 lbs. weight, valued at £883,632. At this time the industry was most lucrative. Pairs of birds that had already bred, or that were sold with a guarantee that they would breed, realised readily £200 a pair and upwards, whilst

as high as £1000 was in more than one instance given for particularly well known birds of superior plumage, and £10 each was the standing price for chicks a few days old. This state of things induced a mania for ostrich farming; all who could scrape money together plunged into it. Companies were formed in every town and village; the incubation and rearing of birds rapidly multiplied, and in a short time was far in excess of the demand. Prices then suddenly fell, causing severe losses and, in some cases, ruin to many of those who had embarked their fortunes in the industry.

The highest value of the export of ostrich feathers from South Africa was in 1882, the weight that year being 253,954 lbs., and the declared value at the Cape Custom House being £1,093,989. But in 1886 came a heavy drop in the value of feathers. That year saw the greatest export in feathers ever made, viz., 288,568 lbs.; but the declared value was only £546,230, being a fall in value of over 50 per cent., as compared with 1882. This gave a great check to the industry, and the weight of feathers exported has decreased ever since, till in 1891 it was 198,046 lbs. From 1890 the value of feathers again rose, and has remained steady ever since.

The following table of exports, from the South African Customs Returns, will show more clearly the great fall and returning rise in value:—

	Weight in lbs.				Declared value. £
1882	.	.	253,954	.	1,093,989
1883	.	.	247,179	.	931,380
1884	.	.	233,411	.	966,479
1885	.	.	251,084	.	585,279
1886	.	.	288,568	.	546,230
1887	.	.	268,832	.	365,587
1888	.	.	259,967	.	347,792
1889	.	.	229,137	.	365,882
1890	.	.	212,276	.	563,948
1891	.	.	198,046	.	468,221
1892	.	.	257,027	.	517,009

The following table, showing the value per lb. of ostrich feathers exported from the Cape, given at quinquennial periods, may prove of interest. It must be borne in mind that they are average values of all kinds of ostrich feathers exported, including "Dark Chicks" worth 2s. per lb., and "Prime Whites" worth very many pounds per lb.

					£	s.	d.
1850, Average per lb..	.	.	.	.	3	13	0
1855	"	"	.	.	6	0	0
1860	"	"	.	.	8	8	0
1865	"	"	.	.	3	14	0
1870	"	"	.	.	3	1	0
1875	"	"	.	.	6	3	0
1880	"	"	.	.	5	8	0
1885	"	"	.	.	2	6	8
1890	"	"	.	.	2	13	1½
1891	"	"	.	.	2	7	3¼

The last census, taken in the year 1891, showed the number of domesticated ostriches in the Cape Colony to be 154,880; and practically this is the number in South Africa, as there is comparatively little ostrich farming carried on outside the boundaries of the Colony; the heavily-grassed flat country of the Republics, Natal, and Bechuanaland, appearing to be ill suited to the industry. Ondtshoorn, with its great facilities for placing lands under irrigation and growing lucerne and other crops, is first on the list of ostrich-rearing districts, the total number of birds there being 27,000; Albany comes next, with 9,772 birds, and then the following districts in their order: Somerset East, 9,211; Uitenhage, 8,489; Willowmore, 8,262; Cradock, 5,934; Jansenville, 5,281; Humansdorp, 4,518; Riversdale, 3,958; Bedford, 3,541; Calvinia, 3,459; Murraysburg, 3,361; Aberdeen, 3,221; Swellendam, 2,790; Uniondale, 2,474; Prince Albert, 2,457; Bathurst, 2,412; Colesberg, 1,925; Worcester, 1,108; other districts carry smaller numbers. The income from ostrich farming at present prices, for birds and feathers, is nearly double that from sheep-farming, but the successful carrying on of the industry requires knowledge and experience, close personal supervision, and suitable pastures, such as the mixed edible bushes and grasses of the Karroo.

We can imagine nothing more delightful and interesting to a traveller than a visit to a large ostrich farm. Let us try and describe what may be seen on one we know well. The size of the farm is 13,000 acres, situated in the Eastern Province of the Cape Colony. The herbage is a mixture of grass, and succulent Karroo bushes. The rainfall in this part of the Eastern Province is too uncertain to allow of cultivation without irrigation, so the cultivation is confined to a few acres of lucerne irrigated by pumps, some soft green food being indispensable for rearing the little ostrich chicks during droughts. On the farm are kept 600 ostriches and 400 breeding cattle. The whole property is enclosed

by strong wire fences five feet high, and subdivided into numerous camps, with similar fences. Near the homestead the camps are of about 100 acres each, being appropriated to the rearing of the young birds. Beyond these again are camps of about 25 acres each, these being given up to a single pair of superior old birds in each camp for breeding, whilst beyond these again are large camps of about 2,600 acres in extent, with 150 birds in each. But let us take a stroll in these camps and see what is going on. Here in the first we find an old Hottentot with about thirty little ostriches only a few days old around him. These have all been hatched in the incubator, and he is acting as nurse to them, cutting up lucerne for them to eat, supplying them with fine gravel to fill their gizzards with to grind their food, breaking up bones to let them get a supply of phosphates, and giving them wheat and water, and at sundown he will bring them back to the incubator for warmth, or should the weather change and rain come on he will be seen hurrying home with his thirty little children following him to a warm, well-lighted room with a clean sanded floor. In the next camp we have a pair of birds and about fifteen chicks accompanied by a Kaffir, who has been with them every day from the time they hatched to get them tame and accustomed to man. These have been hatched by the parent birds, who will brood them at night in the camp. But great risks are run by this method of rearing, from wild animals catching the chicks, as numbers of carnivorous animals of nearly every known species abound in South Africa, the most destructive to young ostriches being the jackals, a single one of which will destroy a whole brood in a night. Our host informs us that he is compelled to keep a man constantly employed laying poison and setting traps. The poison is laid by inserting strychnia in pieces of meat and placing the pieces at short distances all round the camps. In consequence of this wholesale destruction of the carnivora, game abounds on the farm, and as we walk about, beautiful antelopes of different kinds are constantly springing up and bounding away in front of us, and in the afternoon our host lends us a rifle, and, taking us into some unoccupied camps we bring down our first buck.

But here we come to another camp, in which we are told there is a nest, and as we enter a heavy thorn-bush is given to us, and we are told that if the male bird charges we are to hold it to his eyes. But we do not see the cock bird, and have got some distance in, and can just see the hen bird upon the nest with its neck stretched along the ground, making itself look as much as possible like one of the monster ant-heaps that abound in the country, when we are startled by three tremendous roars behind us, and only just have time to put up our bush when the infuri-

ated cock charges down as fast as a horse can gallop, making every nerve in our body quiver with fear as we remember having heard of broken ribs and legs, and men killed by savage male birds; but we follow the example of our conductor, and keep the bush at a level with the bird's eyes, when, just as he reaches the bush, he stops suddenly, his instincts teaching him not to risk his eyesight against the thorns. Then we move on to the nest, keeping the cock at bay with our bushes; but we are thankful when it is over, as he dodges round us, first on this side, then on that, always trying to get his head past our bush; and should he succeed, he would instantly knock us down with a kick from his foot, armed as it is with the formidable horny nail. The kick is delivered forward and downwards, and with immense force when at the height of a man's breast, gradually losing its force as the foot nears the ground, in consequence of which many men have saved their lives, when attacked unprepared, by lying flat on the ground, thereby escaping with a severe trampling, but no broken bones.



We, however, arrive at the nest without accident, when, to our astonishment, our conductor suddenly lays his bush down and handles the eggs, when we find that the hitherto infuriated cock's nature has quite changed; he that a moment ago was trying with all his might to get at us and kill us now stands a dejected, beseeching creature, uttering a plaintive noise, and beseeching us in every possible way not to break his eggs. The nest we find to be merely a scratched hollow in a sandy place, with seventeen eggs in it, weighing three pounds each, upon which the parent birds must sit for six weeks, the cock sitting by night and the hen by day,

the eggs being exposed to many risks of destruction by jackals, baboons, and carrion crows, or by heavy rains filling the nest with water. The *modus operandi* of the carrion crows to get at the contents of the eggs is very ingenious; their bills are not strong enough to break the shell, so they take a good-sized stone in their claws, and rising up to a considerable height, let it drop on the eggs; but unless there are suitable stones near the nest they cannot do this, seeming not to be able to carry the stones horizontally.

But now we arrive at one of the large camps with a troop of 150 full grown birds in it, and here in the corner we have a planked yard: this is where the birds are plucked, the one end being movable, so that when the birds are in, the end can be moved up and the birds packed in so closely that they have no room to kick. Just as we enter, we observe the birds coming over the hill, being driven on by ten men on horseback, each man carrying his thorn-bush to turn a refractory bird, or to master a savage cock. The birds being yarded, the plucking begins, the tails and long black and drab feathers are pulled out, the white feathers being cut off and the stumps left for two months, till the quill is ripe, this being done to get the feather before it is damaged, and the quill being left in so as not to injure the socket by pulling it before it is ready to be shed. Some breeders, we are told, take only one crop a year, and draw the stumps in summer, when the pasturage is good and the birds are in best condition. Much care and attention is now being given to the selection of birds for breeding, and great improvement in the condition and quality of feathers produced is looked for. On a few of the best ostrich farms, the birds are dipped immediately after being plucked, owing to their being much annoyed by a large black fly, that infests them in great numbers, and bites them severely. The tank in which they are dipped is a sunken one about seven feet deep and forty feet long, filled with water heated up to 103°, and a preparation of sulphur or carbolic acid added. Into this they are pushed bodily, and made to swim out; the smell of the sulphur, remaining in the feathers many weeks afterwards, keeps the flies away.

We now return to the homestead and visit the incubator room, which is constructed to be as little affected by changes of temperature as possible. The machines used are the "Douglass" Patents. Then we visit the feather room and see the feathers being sorted into the different qualities, and done up in bunches, either for sale in the Colony or for shipment to England. We then visit the kraals, and find some seventy or eighty cows being milked, as dairy farming can be most successfully carried on in conjunction

with ostrich farming; the cattle eating the coarser grasses, and tending to keep the bush from getting too thick for the ostriches to pass amongst it. We find all the labour on the farm is done by natives, who make excellent servants for managing stock, and as the natives are exceedingly fond of milk, the ostrich farmer who has an unlimited amount of milk to give them greatly reduces the cost of their food, and makes them contented and happy.

Such are shortly some of the sights, with many variations, that may be seen on an ostrich farm; whilst the visitor will probably be regaled at dinner with a luscious omelette made from an ostrich egg, or he may be asked to have a slice of roast ostrich, the meat being very good eating, though as yet little used.

In concluding this short notice of ostrich farming, we must remind our readers that the Cape Colony, as it was the first to domesticate the ostrich, has hitherto had a practical monopoly of the industry. But in 1883 several shipments of ostriches took place to South Australia, the Argentine Republic, and to California; and the Cape Parliament, taking the alarm that the Colony was in danger of losing its lucrative monopoly, imposed an export tax of £100 on every ostrich, and £5 on every ostrich egg, exported.

CHAPTER XIV.

SHEEP-FARMING AND WOOL-GROWING.

BY WILHELM SPILHAUS.

THE production of fine wool, and the fashioning of textile fabrics from it, may well serve as a measure of progress in civilization. From the rough sheep-skin—the covering of the savage—to the delicate and beautiful robe that adorns the belle of the evening, is a long stride. With the advance of refinement, the concern for appearance and care for protection against changes of temperature have naturally increased, creating and stimulating an ever-enlarging demand for the “Golden Fleece,” which brings wealth alike to the grower and to the nation.

As a fine-wool producer, the Merino sheep has always been foremost in estimation. Its original home was the Spanish Peninsula, but it appears to have easily adapted itself to the peculiarities of all countries, except where the climate is excessively damp. On the Continent of Europe, during the first half of the century, the breeding of flocks and the production of wool increased rapidly, until, through the growth of population, the ground for pasturage became more and more restricted, and with the advance of manufactures the conversion of wool into fabrics became more advantageous for the nation than the production of the raw article. The supply of the latter was taken over by the newer and less densely populated countries, and amongst them the British Colonies take the first position.

According to Messrs. Helmuth, Schwartze & Co.’s report, we find that in the year 1831 the total importation of wool from the Colonies into the United Kingdom amounted to 11,859 bales, while in 1891 it had grown to the enormous figure of 1,697,473 bales.

To appreciate the importance of this supply to the woollen manufacturing industry of the mother country, it is only necessary

to study the figures furnished by statistics. In 1891, we find that the imports to the United Kingdom were as follows :—

	£
Raw wool	27,856,556
Alpaca, goats' hair, wool rags	1,870,488
Manufactured articles (in all)	11,536,509
Total	41,263,553
Add to this: Productions of the United Kingdom	7,400,000
Grand total of purchases	48,663,553

The exports were as follows :—

	£
Raw wool, English	704,770
„ colonial and foreign	15,785,191
Manufactured articles	45,984,198
62,474,159	
Add to this: Estimated consumption in the United Kingdom (37,888,153 inhabitants at 15s. each per annum)	28,416,114
Grand total of sales and consumption	90,890,273
And we have a balance of	£42,226,720

Which, after deducting the cost of dyes and other minor substances used in the manufacture, would still leave an enormous amount for wages and profits.

The estimate of 15s. per head of population is very moderate. In the Cape Colony the value of woollen manufactures entered for consumption during the year 1891 may be taken as £1,050,350, and with the population at 1,527,244—amongst which there are only 376,987 whites and 838,136 Fingoes and Kafirs—this gives an average of about 14s. per head.

With such a source of wealth in the manufacturing industry it is evident that the raw material ought to be furnished at as low a price as possible; and it is not surprising that even the Protectionist Party in the United States appear to have come to the conclusion that raw wool should be allowed to be imported free of duty in order to enable American manufacturers to compete with their products, on equal terms, in the markets of the world.

In the Cape Colony we have hardly passed the stage of the production of raw material. The climate is well adapted for fine-woolled sheep, but it was not until 1812 that they were successfully introduced. Nearly a century before this the Dutch East India Company had imported sheep, and endeavoured to encourage the production of wool as an industry, but the people thought the carcase and fat of the native breed could not be compensated for by the wool, some of which proved of such inferior quality as to be unsaleable in Europe. In 1790 a number of woolled sheep

were introduced into the Colony by Colonel Gordon, an officer in the Dutch East India Company's service; these were of the Escorial breed, and had been presented by the King of Spain to the Government of Holland. A portion of these were distributed amongst the farmers, and crossed with the native hairy sheep. The remainder (twenty-nine) were disposed of by sale, taken on to Australia by the English warships *Reliance* and *Supply*, and became the original progenitors of the many millions of fine-woolled sheep for which Australia is now renowned. In 1812 two colonists, Mr. J. F. Reitz and Mr. Michael van Breda, imported some fine Electoral sheep from Saxony. These were located on farms in the Bredasdorp—then part of Swellendam—district, and kept up the pure breed for many years. Later on Lord Charles Somerset imported Merinos bred by Sturgeon, and kept them at the Government Farm at Groote Post, in the Darling District, and at the Boschberg, now the town of Somerset East. In 1820 a larger number of well-bred fine-woolled sheep were brought to the country by the English settlers in Albany, and the eastern and western districts of the colony began to rival with each other in the promotion of the new industry. The Afrikander Boers—the distinct race formed from the first white population of various nationalities during nearly two hundred years seclusion in the inland districts—with natural shrewdness and intelligence soon perceived that in the new industry there was a means of satisfying their increased wants, which were quickened by intercourse with the numerous immigrants, fresh from the civilised world, that now poured into the country.

A Willem Burger, in Calvinia, some sixty years ago, procured some sheep from the Swellendam district, and a little later Peschal introduced sheep from Albany into Cradock. Petrus Joubert and Jan Heefer took some to the Colesberg district. Kinnear obtained some of Mr. Reitz's flock for Beaufort West, Dirk de Wet some for Victoria West, and P. J. J. Burger selected sheep in Grahamstown for his farm at Murraysburg. All these districts became in time centres for distribution elsewhere; and by crossing with the native sheep, and again and again recrossing with its progeny, very good results were obtained, and there are now distributed over the Colony in all over thirteen and a half millions of fine-woolled sheep.

Nearly the whole of the Colony is suitable for these sheep, with the exception of some almost waterless parts of Namaqualand, the sandy coast lands, and the so-called Ghanna Karroo, with the district of Ladismith and Oudtshoorn. In the other parts, much as they vary in physical conditions, the Merino sheep thrive well.

A glance at the accompanying table will show the distribution of sheep throughout the Cape Colony, compiled from figures taken from the Census of 1891, and arranged, not according to political, but natural, divisions. The number of Cape (hairy fat-tailed) sheep is inserted in italic figures:—

DISTRIBUTION OF SHEEP IN THE CAPE COLONY.

Section.	Census Districts:— Density of woolled sheep to square mile.	Area in square miles.	No. of Inhabitants.	No. of Merino sheep.	No. of Merino sheep to the square mile.	No. of Merino sheep to each inhabitant.	Total product of wool.	Probable number of bales.	Yield of wool per acre.
							lbs.		lbs.
<i>West Coast. Grain and wine districts (with Cape Town, 51,251 inhabitants, and Paarl, 7,668 inhabitants).</i>	Cape . . . 41.97 Clanwilliam . . . 5.56 Malmesbury . . . 96.46 Paarl . . . 43.52 Piquetberg . . . 36.84 Stellenbosch . . . 29.94 Tullaghl . . . 29.06	12,072	183,563	396,878 (Cape sheep, 95,120)	32.88	2.16	1,338,504	3,830	3.37
<i>South-West Coast Districts.</i>	Bredasdorp . . . 104.54 Caledon . . . 115.40 George . . . 29.35 Knysna . . . 8.15 Mossel Bay . . . 113.04 Riversdale . . . 66.54 Swellendam . . . 60.49	9,919	65,724	741,380 (Cape sheep, 20,762)	74.74	11.28	2,151,485 (the greater part fleece- washed)	7,684	2.91
<i>Inland Grass Districts.</i>	Uniondale . . . 19.25 Humansdorp . . . 47.59 Uitenhage . . . 13.62	6,513	41,208	165,833 (Cape sheep, 17,002)	25.17	4.02	617,681 (part fleece- washed)	1,625	3.77
<i>(With Grahams- town, 10,498 in- habitants).</i>	Albany . . . 52.21 Bedford . . . 15.21 Somerset East . . . 84.3	5,962	54,066	535,401 (Cape sheep, 31,697)	89.80	9.90	2,410,557	6,026	4.56
<i>Country between Karoo and Grass Districts (grain and wine).</i>	Ceres . . . 26.01 Robertson . . . 8.29 Worcester . . . 25.88	8,020	29,936	181,086 (Cape sheep, 72,625)	22.58	6.05	706,412	1,811	3.96
<i>Ghanna Karroo.</i>	Ladismith . . . 0.47 Oudtshoorn . . . 2.39	2,909	30,574	4,541 (Cape sheep, 22,615)	1.56	0.15	3,726	10	Sheep mostly meat slaugh- ter.
<i>North-West Coast.</i>	Namaqualand . . . 0.24	19,462	16,945	4,632 (Cape sheep, 201,625)	0.24	0.27	12,393	31	2.68
<i>Eastern Coast (with Port Elizabeth, 23,266 in- habitants).</i>	Alexandria . . . 6.05 Bathurst . . . 1.10 East London . . . 3.31 Peddie . . . 21.63 Port Elizabeth . . . 12.09	3,035	82,673	26,930 (Cape sheep, 3,931)	8.98	0.33	84,659	223	3.14

by strong wire fences five feet high, and subdivided into numerous camps, with similar fences. Near the homestead the camps are of about 100 acres each, being appropriated to the rearing of the young birds. Beyond these again are camps of about 25 acres each, these being given up to a single pair of superior old birds in each camp for breeding, whilst beyond these again are large camps of about 2,600 acres in extent, with 150 birds in each. But let us take a stroll in these camps and see what is going on. Here in the first we find an old Hottentot with about thirty little ostriches only a few days old around him. These have all been hatched in the incubator, and he is acting as nurse to them, cutting up lucerne for them to eat, supplying them with fine gravel to fill their gizzards with to grind their food, breaking up bones to let them get a supply of phosphates, and giving them wheat and water, and at sundown he will bring them back to the incubator for warmth, or should the weather change and rain come on he will be seen hurrying home with his thirty little children following him to a warm, well-lighted room with a clean sanded floor. In the next camp we have a pair of birds and about fifteen chicks accompanied by a Kaffir, who has been with them every day from the time they hatched to get them tame and accustomed to man. These have been hatched by the parent birds, who will brood them at night in the camp. But great risks are run by this method of rearing, from wild animals catching the chicks, as numbers of carnivorous animals of nearly every known species abound in South Africa, the most destructive to young ostriches being the jackals, a single one of which will destroy a whole brood in a night. Our host informs us that he is compelled to keep a man constantly employed laying poison and setting traps. The poison is laid by inserting strychnia in pieces of meat and placing the pieces at short distances all round the camps. In consequence of this wholesale destruction of the carnivora, game abounds on the farm, and as we walk about, beautiful antelopes of different kinds are constantly springing up and bounding away in front of us, and in the afternoon our host lends us a rifle, and, taking us into some unoccupied camps we bring down our first buck.

But here we come to another camp, in which we are told there is a nest, and as we enter a heavy thorn-bush is given to us, and we are told that if the male bird charges we are to hold it to his eyes. But we do not see the cock bird, and have got some distance in, and can just see the hen bird upon the nest with its neck stretched along the ground, making itself look as much as possible like one of the monster ant-heaps that abound in the country, when we are startled by three tremendous roars behind us, and only just have time to put up our bush when the infuri-

It will be found that nearer the great centres of consumption less value is placed upon the wool, and the qualities for the butcher (in which, as well as in hardiness, the Cape sheep surpass the Merino) are studied more. Therefore in the West coast grain and wine districts, the wool production is of secondary consideration; the sheep are mostly shorn twice a year, and the quality of the wool is a matter of accident rather than the result of studied exertions.

The remainder of the Colony may be divided into grass districts and Karroo districts. Amongst the former is the group between the Hottentot Holland Mountains and the forests of George and Knysna. Here most fertile farms stretch along the mountains, which act as natural rain condensers for them. Again, along the coast the lowlands (the "Duineveldt" in the patois of the country) offer good pasturage and health to the animals kept on them, owing to the invigorating sea breezes that prevail over them. In between are lands characteristically called "Ruggens," a series of round hills and valleys, here and there intersected by a small stream or rivulet, except where the Breede river with the waters of the River Zonder End and the Buffeljagd's river take their course towards the sea. These "Ruggens" are less favoured by rain, and not unfrequently suffer from droughts, but form excellent sheep walks. The characteristic feature of the whole of this country is the "Rhenoster bosch" (*Elytropappus rhinocerotis*), a bush that has become evenly distributed through the agency of the Merino sheep, the seed being transported across the country in its fleece. The bush is of no use except for fuel, but beneath it the grass springs up readily, the bush probably promoting its growth rather than checking it, affording with its wiry leaves a protection against the direct rays of the sun. A moderate farm in these districts holds about 1,200 sheep, but there are well-managed estates with 5,000 to 7,000 sheep, the largest flock master owning about 12,000 merinos. The country carries about one sheep to each two acres of grazing-land. At night time the sheep are generally kept in enclosures with a shed at one end, open towards the rising sun. The shearing takes place once a year, generally in October, after the wool is washed on the sheep's back, and wool fairs are held in the more important inland towns.

Passing the great forest-lands that surround the Knysna, we reach the grass districts of Uniondale, Humansdorp and Uitenhage, and further on the eastern slopes of the Sneeuwberg mountains, and that country which formed the cradle of the sheep-farming industry for the East — Albany, Bedford and Somerset East. Here there are famous stock breeders and large flock masters, the better farms holding from 5,000 to 10,000 sheep.

But further to the east and to the north the younger districts have left their older neighbours far behind. The group of districts in the east average about 242 sheep to the square mile, and the northern grass districts, with an average of about 275 sheep, have proved most valuable additions to the Colony. In these districts the contrasts in possession and management are very marked. Next to the flock master who ships his fifty or sixty bales of well-bred well-sorted wool of twelve months' growth to the London auction, is the small farmer who does not trouble about progress or improvement, and the Kafir who takes his wool to the neighbouring village in a few grain bags and shears his sheep twice a year, generally washing them before clipping.

The other native portions of the Transkei have of late been successfully opened out for sheep runs. This country, like the northern border districts, was covered with long hard grass when first taken in occupation, but as the flocks increase the coarse grass disappears and nutritious sweet grass takes its place. The Census returns show of what importance to the Colony this tract is fast becoming.

In Griqualand West, the country of the diamond industry, we find again that Cape sheep predominate greatly over Merinos. But even here the rearing of wool sheep has made much progress of late years, and the wool forwarded already contributes over £16,000 yearly towards the resources of the districts.

Following up the preceding remarks, on a map of the Colony, it will be found that the grass districts we have gone over form a belt all along the coast, extending further inland the more we approach the east. Surrounding this belt and rising above it is the great basin of the Karroo proper, stretching from the Nieuwveld mountains to the Stormbergen. This country, forming one vast high plateau, covering over 107,000 square miles, may be all classed together as Karroo land, its principal characteristics being extreme dryness and monotonous vegetation, consisting of short bushes of even height, seldom above two feet high, with Mimosa trees and Karree trees marking the courses of the generally dry rivers. Owing to its high elevation and its distance from the sea, all moisture is deposited before winds of ordinary strength pass the mountain borders. Only strong and continuous gales carry to it the much-desired rain. The intervals of their occurrence are great and irregular, and at times extend over more than a year. To a stranger the country appears as uninhabitable, but all its vegetation is adapted to its peculiar conditions. The bushes which rise but a few inches above the ground send their roots down to a considerable depth, render-

ing them almost indestructible. These are invaluable fodder plants for sheep. The animals can sustain life even on the stumps, long after every sign of leaf has gone, and the Karroo farmer does not despair so long as there is water in his spring ("fontein"). He spends large sums of money on dams, and on the opening up of springs by the aid of dynamite, or steam pumps and ordinary pumps for supplying his stock with water (Norias, or bucket-pumps, are now greatly in favour). During severe droughts the losses in live stock are extremely heavy, but when the rain falls in sufficient quantity there is a general resurrection of the vegetation. The plants all sprout out again, grass springs up, and there is an abundance of food for the flocks, which, after first suffering from the effects of the sudden change, soon prosper and increase as nowhere else in the world.

The most valuable fruticose food-plants for sheep are the *Pentzia virgata* and the *Pentzia globosa*, seed of which has been sent to Australia; also the *Adenachæna parvifolia* and *Diplopappus filifolius*. These are widely distributed over the Karroo. The *Atriplex Halimus* and the *A. Capensis* (the "Vaal-boshji") likewise furnish good sustenance for sheep. An excellent paper on these and other stock-food plants has been published by Professor MacOwan of the Agricultural Department. No doubt great changes in the pasturage must be effected by the agency of the sheep themselves. Their energy in feeding is chiefly directed to those plants which form their best food. These naturally suffer and lose ground to the advantage of others that are less suitable for food. Thus, as pointed out by the late Dr. Shaw in an interesting paper contributed by him and read many years ago before the Linnean Society, the *Gomphocarpus* species have been favoured particularly, especially the *G. fruticosus* plant, indigenous to the midlands of the Colony, never eaten by any sheep, has come to cover extensive tracts in this country. In the same way the *Chrysocoma tenuifolia*, originally belonging to the south-west of the Colony, has become the prevailing plant of late years. It was first eschewed by sheep, but it is now in some parts their only sustenance, so much so that the mutton becomes impregnated with its rather pleasant aromatic flavour. It was at one time feared that the Karroo sheep-walks would be gradually destroyed as such, first from the above-mentioned causes, and then from the system of over-stocking; but both evils are kept in check and remedied by that greater evil the periodical droughts, which take away the surplus stock, weed out the weaklings from the flocks, and keep alive only those plants which are indigenous to the locality, have a remarkable spontaneous

reproductive power, and are at the same time the best for stock. Of the plants which depend upon the sheep's coat for the distribution of their seed, and in consequence decrease the value of the fleece for the manufacturer, the worst have probably been imported and distributed nearly all over the Colony through the Merino sheep. They are the *Xanthium spinosum*, commonly called burrweed, which is all but extirpated by special legislation; the *Caucalis Africana*, Thunb., and the *Echinosperrum Lapula*, Lehm., the carrot seed of the wool-buyers, and the *Medicago laciniosa*, whose seed does so much to deteriorate wool from La Plata.* As these plants, however, require regular moisture, they cannot spread much in the Karroo districts. A year or two ago the Colony was troubled with a particularly obnoxious seed, that of the "steek-grass" (*Andropogon contortus*, Ness, and *Aristida congesta*, R. and T.), which springs up luxuriantly after heavy rains. The former variety infested the wool, and penetrating the skins of the animals with its sharp points, caused discomfort and even death in the flocks. The same rains, however, brought to life numberless swarms of locusts, and these it appears have in many districts devoured this particular grass.

The farms in the Karroo districts are of large extent, from three up to as much as twelve acres of ground being required for a sheep. The average number of woolled sheep for ordinary farms may be taken as about 1,500, although as many as 3,000 is no uncommon number, and there are several which carry from 7,000 to 10,000 sheep. In the Beaufort West District one farmer now disposes every year of over 300 bales of well-grown and well-packed wool. The well-known Melton wold clip, Victoria West District, amounts to about 110 bales. The Brinscombe Estate, Hanover, disposes of about 130 bales of well-sorted wool. The Klip Kraal clip of about eighty bales from Stormberg is much liked in Port Elizabeth. The sheep are kept in the open air all through the year, but during the night-time they are sheltered from the wind in rough enclosures (kraals) constructed sometimes of stone, flat slate slabs being abundant in most localities, or built up from the dung of the sheep, which is cut out from the floor of the kraal. This is a substance which rapidly accumulates, and soon becomes like hard-baked peat, being extensively used as fuel.

In all divisions west of Victoria West, the universal custom is to shear once a year, although each farmer has his own particular time for performing this work, modified often through dry weather and consequent poor condition of the animals. In the midland districts the sheep are mostly shorn every seven or eight

* Botanical names kindly furnished by Mr. Harry Bolus and Professor MacOwan.

months, but in some of the north-eastern districts the more rapacious system of shearing twice a year prevails.

Spread out over a large country like this, it is obvious that there must be much difference in the quality and breed of sheep. When the Merino was first introduced into this colony broadcloth was universally worn in Europe by those who could afford it, and the demand in consequence being for fine wool, sheep-breeders rivalled with one another to produce the finest of fibre, neglecting all other qualities. The sheep imported by Messrs. Reitz and Van Breda were of the Saxon Electoral breed, small in figure, covered with a fleece of dense, rather short, staple of extremely fine fibre, and in some flocks in the Swellendam district this type may to this day be recognised. Later on, when the serious and sober broadcloth had to give way to tweeds in everyday life, quantity became more desirable than extreme fineness. Gradually, also, the demand for the butcher increased, and colonists then found the Rambouillet breed of sheep the most suitable for their requirements. During the last decade, again, when the worsted industry forged ahead, and there was an increased sale for fine yarns, wools suitable for combing became more in demand, and sheep were imported from all quarters of the globe—Sturgeons, Australians, Tasmanians, and lately the wrinkled sheep bred in Vermont, United States. The last census returns show a total of 945 imported rams and 1,575 imported ewes in the Colony. It speaks well for Griqualand West that of this number 101 rams and 76 ewes are located in that province. Beaufort West shows a return of 106 rams, taking the lead; and next is Albert with 99 rams and 92 ewes; Hanover, 30 rams and 130 ewes; King Williamstown, 19 rams and 229 ewes; Middelburg, 20 rams and 307 ewes; Richmond, 16 rams and 154 ewes; Victoria West, 11 rams and 150 ewes; Willowmore, 37 rams and 124 ewes; and Wodehouse, 67 rams and 20 ewes. These figures do not include stock raised from imported animals. With the exception of the old sheep country between Caledon and Knysna (throughout which district there were only 15 imported rams and 4 imported ewes), the imported stock is distributed all over the colony, and from the breeding centres the progeny of this stock is drafted off again into the neighbouring districts. Thus the breeders in Beaufort West, who go to work with great intelligence and perseverance, hold annual ram sales, and enable the smaller farmers to purchase animals at from £3 to £6 per head, often as good as imported stock.

After so many years of sheep farming in the Colony, it should, of course, not be necessary at all to import stock if breeders could bring the requisite knowledge to bear upon the matter, and kept

a fixed purpose steadily in view. Before deciding upon the kind of animal to produce, they should be clear upon what would be best suited to the condition of their district, bearing in mind that in a moist climate with more abundant pasturage a large sheep, with good combing wool, long and strong in fibre, not too curly, can be reared. In dry districts less weight should be placed upon the size of the carcase, but fineness of wool, with closeness of staple, should be aimed at. We have seen wool from the high north-west (Achter Roggeveld), taken from the progeny of sheep bred in Beaufort West, that reminded one much of such wool as the Ercildown clip from Australia, combining extreme fineness of fibre with good length and strength. It would be most beneficial if our sheep-farmers were to form societies within their districts, meeting from time to time to discuss matters concerning their calling, and in these meetings to decide on the breed of sheep they wish to produce in their district; in other words, to agree upon the points which should be aimed at by them in selecting animals for breeding. This would do more than anything else towards a uniformity in the product of any one district, the want of which is most severely felt by wool-buyers in the Colony, as well as in England.

The Colony being, throughout almost, well adapted for sheep-farming, not much need be said about the diseases of sheep. Most of the troubles to which the animal is subject in the old country have naturally found their way here with the sheep, but are generally less serious, the animals being mostly in the open air and on dry ground. This is with one exception, and this exception, unfortunately, makes up for all the other advantages added together. The *scab* is found throughout the Colony, and causes annually enormous losses in the weight and quality of both wool and sheep. It is a subject recurring in every session of Parliament, and careful men, who have the welfare of the country at heart, labour incessantly to bring about a general compulsory Scab Act. Up to the present this object has not been achieved, but a permissive Act, which can be declared in force in any district if the majority of its inhabitants desire it, has already effected a great deal of good.

In 1830 the Cape exported only 33,000 lbs. of wool. How rapidly the industry increased, however, the following figures will show. In 1850 the weight of the wool exported rose to 5,912,927 lbs., valued at £285,610; in 1860, to 23,219,689 lbs., valued at £1,448,629; in 1870, to 37,283,291 lbs., valued at £1,669,519; in 1872, to 48,822,562 lbs., valued at £3,275,150. This was an exceptionally good year, the abundance arising probably from overstocking of farms in consequence of propitious

seasons. In 1880, the quantity exported was 42,467,962 lbs., worth £2,429,360; in 1890 (the area covered by the industry had been steadily and rapidly extending), it rose to 66,489,297 lbs., valued at £2,196,040; and in 1891 we exported 75,520,701 lbs. weight of wool, valued at £2,264,498. This was the actual weight of the bales as shipped, fleece-washed, scoured and grease; but reduced to grease wool only the exports would be as follows for the last two years: in 1890, 89,448,698 lbs., with an average value per pound of 5·89*d.*; in 1891, 98,441,212 lbs., with an average price of 5·52*d.* It is worth while to compare the average export value with earlier periods. For instance, in 1881, it was 6·68*d.*, and in 1886 it was 4·85*d.*, this last having been the lowest wool year since 1860, the bale of wool being then valued in England at an average of £13 10*s.*, whereas in 1872 the bale was considered to be worth, on an average, £26 10*s.**

The low value of wool in Europe is the source of great vexation amongst our farmers, and a serious diminution of our resources. In comparison with other staple articles, the reduction, however,

* *Vide Messrs. Helmuth, Schwartz & Co.'s Table of Values and Quantities of Colonial Wool Imported into Europe and America from 1860 to 1891:—*

Year.	Australasian Bales.	Cape Bales.	Total Colonial Bales.	Average Value per Bale.	Total Value.	
				£		
1860	187,000	79,000	266,000	25½	6,850,000	} £7,000,000 Period.
1861	212,000	84,000	296,000	23½	6,882,000	
1862	227,000	82,000	309,000	22½	7,030,000	
1863	242,000	94,000	336,000	22½	7,544,000	
1864	302,000	113,000	415,000	24½	10,271,000	
1865	334,000	109,000	443,000	23½	10,521,000	} £11,000,000 Period.
1866	351,000	128,000	479,000	24½	11,735,000	
1867	414,000	135,000	549,000	20½	11,392,000	
1868	483,000	156,000	639,000	18½	11,522,000	
1869	504,000	153,000	657,000	15½	10,348,000	
1870	546,000	152,000	698,000	16½	11,591,000	} Year of transition .
1871	573,000	186,000	759,000	20½	15,669,000	
1872	554,000	189,000	743,000	26½	19,690,000	
1873	571,000	176,000	747,000	24½	18,115,000	
1874	659,000	170,000	829,000	23½	19,274,000	
1875	720,000	197,000	917,000	22½	20,403,000	} £20,000,000 Period.
1876	769,000	167,000	936,000	18½	17,550,000	
1877	835,000	186,000	1,021,000	18½	19,144,000	
1878	801,000	169,000	970,000	18½	18,187,000	
1879	826,000	189,000	1,015,000	16½	16,748,000	
1880	869,000	219,000	1,088,000	20½	22,632,000	} £26,000,000 Period.
1881	957,000	204,000	1,161,000	17½	20,027,000	
1882	993,000	197,000	1,190,000	17½	20,825,000	
1883	1,054,000	199,000	1,253,000	16½	20,988,000	
1884	1,112,000	191,000	1,303,000	16	20,948,000	
1885	1,094,000	188,000	1,282,000	14	17,948,000	} £26,000,000 Period.
1886	1,196,000	236,000	1,432,000	13½	19,332,000	
1887	1,207,000	237,000	1,444,000	14	20,216,000	
1888	1,316,000	249,000	1,604,000	13½	21,654,000	
1889	1,385,000	310,000	1,695,000	15½	26,272,000	
1890	1,411,000	288,000	1,699,000	14½	25,060,000	} £26,000,000 Period.
1891	1,683,000	322,000	2,005,000	13½	27,067,000	

DISTRIBUTION OF SHEEP IN THE CAPE COLONY—*continued.*

Section.	Census Districts:— Density of woolled sheep to square mile.	Area in square miles.	No. of Inhabitants.	No. of Merino sheep.	No. of Merino sheep to the square mile.	No. of Merino sheep to each inhabitant.	Total product of wool.	Probable number of bales.	Yield of wool per sheep.	
							lbs.		lbs.	
Karoo Districts.	Aberdeen	42·44	107,899	178,299	5,827,459 (Cape sheep, 2,011,944)	64·01	32·68	24,776,990	61,945	4·25
	Beaufort West	65·24								
	Calvinia	10·96								
	Carnarvon	35·64								
	Colesberg	123·97								
	Craddock	90·76								
	Fraserburg	39·53								
	Graaff Reinet	78·67								
	Hanover	113·83								
	Hopetown	73·83								
	Jansenville	31·73								
	Middelburg	104·81								
	Murraysburg	70·71								
	Phillipstown	100·49								
	Prieska	37·75								
	Prince Albert	35·53								
Eastern Districts (grass; with 149,794 Fingoes and Kafirs).	Richmond	90·83	7,236	184,677	1,753,576 (Cape sheep, 33,795)	242·34	9·50	8,150,180 (partifleece- washed)	23,302	4·64
	Steynsburg	171·14								
	Sutherland	44·45								
	Tarka	229·53								
	Victoria West	117·64								
	Willowmore	28·41								
	Fort Beaufort	154·09								
	Stockenstruom	202·85								
	Victoria East	85·04								
	Cathcart	324·74								
Northern Districts (grass; with 61,334 Fingoes and Kafirs).	Kingwillamstown	115·10	8,269	88,820	2,283,863 (Cape sheep, 47,561)	275·53	25·74	10,369,703	26,000	4·54
	Komgha	195·05								
	Queenstown	29·57								
	Stutterheim	445·16								
	Herschell	162·87								
Grigoland West (with Kimberley, 28,718 inhabi- tants, and Bea- consfield, 10,478 inhabitants).	Albert	227·38	15,197	83,375	283,577 (Cape sheep, 411,205)	18·65	3·40	785,633	1,970	2·77
	Allwal North	302·51								
	Barkly East	389·58								
	Woodhouse	270·22								
	Barkly West	11·23								
Grigoland East (with 143,851 Fingoes and Kafirs).	Hay	12·52	7,594	152,618	435,000 (Cape sheep, 10,642)	57·28	2·85	1,504,433 (partifleece- washed)	4,310	3·47
	Maclear	42·55								
	Matatiele	52·37								
	Mount Ayliff	14·54								
	Mount Currie	91·12								
	Mount Fletcher	35·61								
	Mount Frere	38·48								
	Qumbu	85·83								
	Tsoelo	86·03								
	Umsinkulu	56·22								
Trompsburg (with 173,416 Kafirs and Fingoes).	Elliotdale	1·47	4,122	180,415	457,836 (Cape sheep, 33,702)	111·07	2·54	1,556,745 (partifleece- washed)	4,879	3·40
	Engcobo	133·86								
	Mqandulo	82·36								
	St. Marks	155·40								
	Umtata	119·05								
	Xalanga	98·77								
	Fort St. Johns	—								
Transkei (with 162,095 Fingoes and Kafirs).	Butterworth	204·16	2,552	153,563	533,019 (Cape sheep, 30,191)	208·86	3·47	1,565,566 (partifleece- washed)	5,398	2·90
	Idutywa	307·06								
	Kentani	101·35								
	Nqamakwe	359·35								
	Tsomo	214·42								
	Willowvale	76·58								
		220,881	1,526,456	13,631,011 (Cape sheep, 3,075,015)	61·72	8·93	86,038,689	148,744	4·11	

It will be found that nearer the great centres of consumption less value is placed upon the wool, and the qualities for the butcher (in which, as well as in hardiness, the Cape sheep surpass the Merino) are studied more. Therefore in the West coast grain and wine districts, the wool production is of secondary consideration; the sheep are mostly shorn twice a year, and the quality of the wool is a matter of accident rather than the result of studied exertions.

The remainder of the Colony may be divided into grass districts and Karroo districts. Amongst the former is the group between the Hottentot Holland Mountains and the forests of George and Knysna. Here most fertile farms stretch along the mountains, which act as natural rain condensers for them. Again, along the coast the lowlands (the "Duineveldt" in the patois of the country) offer good pasturage and health to the animals kept on them, owing to the invigorating sea breezes that prevail over them. In between are lands characteristically called "Ruggens," a series of round hills and valleys, here and there intersected by a small stream or rivulet, except where the Breede river with the waters of the River Zonder End and the Buffeljagd's river take their course towards the sea. These "Ruggens" are less favoured by rain, and not unfrequently suffer from droughts, but form excellent sheep walks. The characteristic feature of the whole of this country is the "Rhenoster bosch" (*Elytropappus rhinocerotis*), a bush that has become evenly distributed through the agency of the Merino sheep, the seed being transported across the country in its fleece. The bush is of no use except for fuel, but beneath it the grass springs up readily, the bush probably promoting its growth rather than checking it, affording with its wiry leaves a protection against the direct rays of the sun. A moderate farm in these districts holds about 1,200 sheep, but there are well-managed estates with 5,000 to 7,000 sheep, the largest flock master owning about 12,000 merinos. The country carries about one sheep to each two acres of grazing-land. At night time the sheep are generally kept in enclosures with a shed at one end, open towards the rising sun. The shearing takes place once a year, generally in October, after the wool is washed on the sheep's back, and wool fairs are held in the more important inland towns.

Passing the great forest-lands that surround the Knysna, we reach the grass districts of Uniondale, Humansdorp and Uitenhage, and further on the eastern slopes of the Sneeuwberg mountains, and that country which formed the cradle of the sheep-farming industry for the East — Albany, Bedford and Somerset East. Here there are famous stock breeders and large flock masters, the better farms holding from 5,000 to 10,000 sheep.

But further to the east and to the north the younger districts have left their older neighbours far behind. The group of districts in the east average about 242 sheep to the square mile, and the northern grass districts, with an average of about 275 sheep, have proved most valuable additions to the Colony. In these districts the contrasts in possession and management are very marked. Next to the flock master who ships his fifty or sixty bales of well-bred well-sorted wool of twelve months' growth to the London auction, is the small farmer who does not trouble about progress or improvement, and the Kafir who takes his wool to the neighbouring village in a few grain bags and shears his sheep twice a year, generally washing them before clipping.

The other native portions of the Transkei have of late been successfully opened out for sheep runs. This country, like the northern border districts, was covered with long hard grass when first taken in occupation, but as the flocks increase the coarse grass disappears and nutritious sweet grass takes its place. The Census returns show of what importance to the Colony this tract is fast becoming.

In Griqualand West, the country of the diamond industry, we find again that Cape sheep predominate greatly over Merinos. But even here the rearing of wool sheep has made much progress of late years, and the wool forwarded already contributes over £16,000 yearly towards the resources of the districts.

Following up the preceding remarks, on a map of the Colony, it will be found that the grass districts we have gone over form a belt all along the coast, extending further inland the more we approach the east. Surrounding this belt and rising above it is the great basin of the Karroo proper, stretching from the Nieuwveld mountains to the Stormbergen. This country, forming one vast high plateau, covering over 107,000 square miles, may be all classed together as Karroo land, its principal characteristics being extreme dryness and monotonous vegetation, consisting of short bushes of even height, seldom above two feet high, with Mimosa trees and Karree trees marking the courses of the generally dry rivers. Owing to its high elevation and its distance from the sea, all moisture is deposited before winds of ordinary strength pass the mountain borders. Only strong and continuous gales carry to it the much-desired rain. The intervals of their occurrence are great and irregular, and at times extend over more than a year. To a stranger the country appears as uninhabitable, but all its vegetation is adapted to its peculiar conditions. The bushes which rise but a few inches above the ground send their roots down to a considerable depth, render-

ing them almost indestructible. These are invaluable fodder plants for sheep. The animals can sustain life even on the stumps, long after every sign of leaf has gone, and the Karroo farmer does not despair so long as there is water in his spring ("fontein"). He spends large sums of money on dams, and on the opening up of springs by the aid of dynamite, or steam pumps and ordinary pumps for supplying his stock with water (Norias, or bucket-pumps, are now greatly in favour). During severe droughts the losses in live stock are extremely heavy, but when the rain falls in sufficient quantity there is a general resurrection of the vegetation. The plants all sprout out again, grass springs up, and there is an abundance of food for the flocks, which, after first suffering from the effects of the sudden change, soon prosper and increase as nowhere else in the world.

The most valuable fruticose food-plants for sheep are the *Pentzia virgata* and the *Pentzia globosa*, seed of which has been sent to Australia; also the *Adenachæna parvifolia* and *Diplopappus filifolius*. These are widely distributed over the Karroo. The *Atriplex Halimus* and the *A. Capensis* (the "Vaal-boshji") likewise furnish good sustenance for sheep. An excellent paper on these and other stock-food plants has been published by Professor MacOwan of the Agricultural Department. No doubt great changes in the pasturage must be effected by the agency of the sheep themselves. Their energy in feeding is chiefly directed to those plants which form their best food. These naturally suffer and lose ground to the advantage of others that are less suitable for food. Thus, as pointed out by the late Dr. Shaw in an interesting paper contributed by him and read many years ago before the Linnean Society, the *Gomphocarpus* species have been favoured particularly, especially the *G. fruticosus* plant, indigenous to the midlands of the Colony, never eaten by any sheep, has come to cover extensive tracts in this country. In the same way the *Chrysocoma tenuifolia*, originally belonging to the south-west of the Colony, has become the prevailing plant of late years. It was first eschewed by sheep, but it is now in some parts their only sustenance, so much so that the mutton becomes impregnated with its rather pleasant aromatic flavour. It was at one time feared that the Karroo sheep-walks would be gradually destroyed as such, first from the above-mentioned causes, and then from the system of over-stocking; but both evils are kept in check and remedied by that greater evil the periodical droughts, which take away the surplus stock, weed out the weaklings from the flocks, and keep alive only those plants which are indigenous to the locality, have a remarkable spontaneous

reproductive power, and are at the same time the best for stock. Of the plants which depend upon the sheep's coat for the distribution of their seed, and in consequence decrease the value of the fleece for the manufacturer, the worst have probably been imported and distributed nearly all over the Colony through the Merino sheep. They are the *Xanthium spinosum*, commonly called burrweed, which is all but extirpated by special legislation; the *Caucalis Africana*, Thunb., and the *Echinosperrum Lapula*, Lehm., the carrot seed of the wool-buyers, and the *Medicago laciniosa*, whose seed does so much to deteriorate wool from La Plata.* As these plants, however, require regular moisture, they cannot spread much in the Karroo districts. A year or two ago the Colony was troubled with a particularly obnoxious seed, that of the "steek-grass" (*Andropogon contortus*, Ness, and *Aristida congesta*, R. and T.), which springs up luxuriantly after heavy rains. The former variety infested the wool, and penetrating the skins of the animals with its sharp points, caused discomfort and even death in the flocks. The same rains, however, brought to life numberless swarms of locusts, and these it appears have in many districts devoured this particular grass.

The farms in the Karroo districts are of large extent, from three up to as much as twelve acres of ground being required for a sheep. The average number of woolled sheep for ordinary farms may be taken as about 1,500, although as many as 3,000 is no uncommon number, and there are several which carry from 7,000 to 10,000 sheep. In the Beaufort West District one farmer now disposes every year of over 300 bales of well-grown and well-packed wool. The well-known Melton wold clip, Victoria West District, amounts to about 110 bales. The Brinscombe Estate, Hanover, disposes of about 130 bales of well-sorted wool. The Klip Kraal clip of about eighty bales from Stormberg is much liked in Port Elizabeth. The sheep are kept in the open air all through the year, but during the night-time they are sheltered from the wind in rough enclosures (kraals) constructed sometimes of stone, flat slate slabs being abundant in most localities, or built up from the dung of the sheep, which is cut out from the floor of the kraal. This is a substance which rapidly accumulates, and soon becomes like hard-baked peat, being extensively used as fuel.

In all divisions west of Victoria West, the universal custom is to shear once a year, although each farmer has his own particular time for performing this work, modified often through dry weather and consequent poor condition of the animals. In the midland districts the sheep are mostly shorn every seven or eight

* Botanical names kindly furnished by Mr. Harry Bolus and Professor MacOwan.

months, but in some of the north-eastern districts the more rapacious system of shearing twice a year prevails.

Spread out over a large country like this, it is obvious that there must be much difference in the quality and breed of sheep. When the Merino was first introduced into this colony broadcloth was universally worn in Europe by those who could afford it, and the demand in consequence being for fine wool, sheep-breeders rivalled with one another to produce the finest of fibre, neglecting all other qualities. The sheep imported by Messrs. Reitz and Van Breda were of the Saxon Electoral breed, small in figure, covered with a fleece of dense, rather short, staple of extremely fine fibre, and in some flocks in the Swellendam district this type may to this day be recognised. Later on, when the serious and sober broadcloth had to give way to tweeds in everyday life, quantity became more desirable than extreme fineness. Gradually, also, the demand for the butcher increased, and colonists then found the Rambouillet breed of sheep the most suitable for their requirements. During the last decade, again, when the worsted industry forged ahead, and there was an increased sale for fine yarns, wools suitable for combing became more in demand, and sheep were imported from all quarters of the globe—Sturgeons, Australians, Tasmanians, and lately the wrinkled sheep bred in Vermont, United States. The last census returns show a total of 945 imported rams and 1,575 imported ewes in the Colony. It speaks well for Griqualand West that of this number 101 rams and 76 ewes are located in that province. Beaufort West shows a return of 106 rams, taking the lead; and next is Albert with 99 rams and 92 ewes; Hanover, 30 rams and 130 ewes; King Williamstown, 19 rams and 229 ewes; Middelburg, 20 rams and 307 ewes; Richmond, 16 rams and 154 ewes; Victoria West, 11 rams and 150 ewes; Willowmore, 37 rams and 124 ewes; and Wodehouse, 67 rams and 20 ewes. These figures do not include stock raised from imported animals. With the exception of the old sheep country between Caledon and Knysna (throughout which district there were only 15 imported rams and 4 imported ewes), the imported stock is distributed all over the colony, and from the breeding centres the progeny of this stock is drafted off again into the neighbouring districts. Thus the breeders in Beaufort West, who go to work with great intelligence and perseverance, hold annual ram sales, and enable the smaller farmers to purchase animals at from £3 to £6 per head, often as good as imported stock.

After so many years of sheep farming in the Colony, it should, of course, not be necessary at all to import stock if breeders could bring the requisite knowledge to bear upon the matter, and kept

a fixed purpose steadily in view. Before deciding upon the kind of animal to produce, they should be clear upon what would be best suited to the condition of their district, bearing in mind that in a moist climate with more abundant pasturage a large sheep, with good combing wool, long and strong in fibre, not too curly, can be reared. In dry districts less weight should be placed upon the size of the carcass, but fineness of wool, with closeness of staple, should be aimed at. We have seen wool from the high north-west (Achter Roggeveld), taken from the progeny of sheep bred in Beaufort West, that reminded one much of such wool as the Ercildown clip from Australia, combining extreme fineness of fibre with good length and strength. It would be most beneficial if our sheep-farmers were to form societies within their districts, meeting from time to time to discuss matters concerning their calling, and in these meetings to decide on the breed of sheep they wish to produce in their district; in other words, to agree upon the points which should be aimed at by them in selecting animals for breeding. This would do more than anything else towards a uniformity in the product of any one district, the want of which is most severely felt by wool-buyers in the Colony, as well as in England.

The Colony being, throughout almost, well adapted for sheep-farming, not much need be said about the diseases of sheep. Most of the troubles to which the animal is subject in the old country have naturally found their way here with the sheep, but are generally less serious, the animals being mostly in the open air and on dry ground. This is with one exception, and this exception, unfortunately, makes up for all the other advantages added together. The *scab* is found throughout the Colony, and causes annually enormous losses in the weight and quality of both wool and sheep. It is a subject recurring in every session of Parliament, and careful men, who have the welfare of the country at heart, labour incessantly to bring about a general compulsory Scab Act. Up to the present this object has not been achieved, but a permissive Act, which can be declared in force in any district if the majority of its inhabitants desire it, has already effected a great deal of good.

In 1830 the Cape exported only 33,000 lbs. of wool. How rapidly the industry increased, however, the following figures will show. In 1850 the weight of the wool exported rose to 5,912,927 lbs., valued at £285,610; in 1860, to 23,219,689 lbs., valued at £1,448,629; in 1870, to 37,283,291 lbs., valued at £1,669,519; in 1872, to 48,822,562 lbs., valued at £3,275,150. This was an exceptionally good year, the abundance arising probably from overstocking of farms in consequence of propitious

seasons. In 1880, the quantity exported was 42,467,962 lbs., worth £2,429,360; in 1890 (the area covered by the industry had been steadily and rapidly extending), it rose to 66,489,297 lbs., valued at £2,196,040; and in 1891 we exported 75,520,701 lbs. weight of wool, valued at £2,264,498. This was the actual weight of the bales as shipped, fleece-washed, scoured and grease; but reduced to grease wool only the exports would be as follows for the last two years: in 1890, 89,448,698 lbs., with an average value per pound of 5·89*d.*; in 1891, 98,441,212 lbs., with an average price of 5·52*d.* It is worth while to compare the average export value with earlier periods. For instance, in 1881, it was 6·68*d.*, and in 1886 it was 4·85*d.*, this last having been the lowest wool year since 1860, the bale of wool being then valued in England at an average of £13 10*s.*, whereas in 1872 the bale was considered to be worth, on an average, £26 10*s.**

The low value of wool in Europe is the source of great vexation amongst our farmers, and a serious diminution of our resources. In comparison with other staple articles, the reduction, however,

* *Vide* Messrs. Helmuth, Schwartz & Co.'s Table of Values and Quantities of Colonial Wool Imported into Europe and America from 1860 to 1891:—

Year.	Australasian Bales.	Cape Bales.	Total Colonial Bales.	Average Value per Bale.	Total Value.	
				£	£	
1860	187,000	79,000	266,000	25½	6,850,000	£7,000,000 Period.
1861	212,000	84,000	296,000	23½	6,882,000	
1862	227,000	82,000	309,000	22½	7,030,000	
1863	242,000	94,000	336,000	22½	7,444,000	
1864	302,000	113,000	415,000	24½	10,271,000	
1865	334,000	109,000	443,000	23½	10,521,000	£11,000,000 Period.
1866	351,000	123,000	479,000	24½	11,735,000	
1867	414,000	135,000	549,000	20½	11,392,000	
1868	483,000	156,000	639,000	18½	11,522,000	
1869	504,000	153,000	657,000	15½	10,348,000	
1870	546,000	152,000	698,000	16½	11,591,000	Year of transition.
1871	573,000	186,000	759,000	20½	15,660,000	
1872	554,000	189,000	743,000	26½	19,690,000	
1873	571,000	176,000	747,000	24½	18,115,000	
1874	659,000	170,000	829,000	23½	19,274,000	
1875	720,000	197,000	917,000	22½	20,403,000	£20,000,000 Period.
1876	769,000	167,000	936,000	18½	17,550,000	
1877	835,000	186,000	1,021,000	18½	19,144,000	
1878	801,000	169,000	970,000	18½	18,147,000	
1879	826,000	189,000	1,015,000	16½	16,748,000	
1880	869,000	219,000	1,088,000	20½	22,032,000	£26,000,000 Period.
1881	957,000	204,000	1,161,000	17½	20,027,000	
1882	993,000	197,000	1,190,000	17½	20,825,000	
1883	1,054,000	199,000	1,253,000	16½	20,988,000	
1884	1,112,000	191,000	1,303,000	16	20,848,000	
1885	1,094,000	188,000	1,282,000	14	17,948,000	£26,000,000 Period.
1886	1,196,000	236,000	1,432,000	13½	19,332,000	
1887	1,207,000	237,000	1,444,000	14	20,216,000	
1888	1,316,000	289,000	1,604,000	13½	21,654,000	
1889	1,385,000	310,000	1,695,000	15½	26,272,000	
1890	1,411,000	288,000	1,699,000	14½	25,060,000	£26,000,000 Period.
1891	1,683,000	322,000	2,005,000	13½	27,067,000	

is not surprising. Cotton has receded in price even more (with a greater increase of production); and of nearly everything else it requires far less gold for purchasing than after the world had been swamped with the enormous outputs of gold in Australia and California. The progressing gold-fields of South Africa bid fair, however, to be great factors in supplying the world with the necessary precious metal, and in course of time this must tell also upon the value of our staple product.

The following Table shows the Exports from the different parts of the Colony, with the average prices in decimals:—

EXPORT OF WOOL FROM THE COLONY, 1891.

Name of port.	Fleece-washed.				Scoured.				Grease.			
	Number of bales.	lbs.	Average price per lb.	Value.	Number of bales.	lbs.	Average price per lb.	Value.	Number of bales.	lbs.	Average price per lb.	Value.
			d.	£			d.	£			d.	£
Cape Town . .	3,607	882,468	9·62	35,371	11,610	1,922,908	14·70	117,792	10,428	4,053,535	5·34	90,161
Mossel Bay . .	1,060	264,333	9·12	10,048	677	143,776	13·69	8,182	1,071	410,553	6·08	10,398
Knysna . . .	..	..	..	..	..	..	..	..	13	3,772	4·53	67
Algoa Bay . .	165	40,812	8·80	1,497	42,285	7,860,085	12·90	422,468	91,179	33,562,283	5·75	804,004
East London . .	11,216	3,248,573	7·86	106,426	20,606	4,086,090	12·01	204,623	52,150	19,041,513	5·72	453,561
Totals . .	16,048	4,436,186	8·29	153,342	75,178	14,012,859	12·91	752,965	154,841	57,071,656	5·71	1,358,191

The total quantity exported exceeds by a great deal the total quantity returned by the Census. This is partly accounted for by wool from the Orange Free State, a considerable quantity of which, both grease and scoured, passes through our ports. A further deficiency must be put down to incorrect returns in the quantity of wool per annum given by many farmers who shear twice a year, or three times in two years. No doubt in many instances the quantity of the last clip only has been returned.

It will be seen that by far the largest quantity of wool is exported from Port Elizabeth. This is the natural outlet for the most densely populated part of the Karroo, and for the districts towards the north. East London is next in importance; and now that the railway is extended direct from King Williamstown into the Free State, it may be expected that the eastern port will absorb a good deal of the trade which has hitherto gone to Port Elizabeth. Cape Town, being farthest away from the wool-

growing centres, exports far less; but from here the superior western wools are shipped, which enjoy a good reputation in the wool trade.

It will be seen that of grease-wool half as much again is shipped from the Colony as of fleece-washed and scoured. In former years it was considered as absolutely necessary to wash the wool on the sheep's back before it was shorn. Gradually farmers came to see that this involved great expense, discomfort to the flocks, and was often impossible owing to the want of water. Buyers also preferred the unwashed wool to fleeces which might have been spoiled in washing, and now the washing on the animal's back is only done by some who are particularly conservative, and on farms where the unwashed wool is so light that an adequate price would not be obtained in the grease. Buyers of combing wool prefer, no doubt, the wool unwashed, and for the United States it can only be shipped in this state, the Legislature placing a premium (in the shape of prohibitive duties on washed wools) upon importing dirt into the country. Wools not suitable for either of these purposes are mostly scoured in the Colony, and this scouring has become an important industry in itself.

The washeries near Port Elizabeth are all situated in Uitenhage, where there is a sufficient supply of water. There are nine establishments in all: The Springfield, Union Works, Despatch, Upper Wool Washing, Lower Wool Washing, Kruis River, Phoenix Works, Lange and Express. These works employ about 500 coloured and a good number of white labourers, and are capable of treating nearly 50,000 bales per annum, a quantity, however, that is not nearly reached. As the railway has extended and cheapened transport, many of the washeries that used to exist in the inland districts, where good water is less plentiful, had naturally to discontinue work, and there are now only the Standard at Middelburg, the Sylvan at Burghersdorp, Glenavon at Somerset East, and the Baths at Cradock. These supply a good deal of the scoured wool which is all sold in Port Elizabeth. In the Orange Free State there are in all thirteen washeries.

Turning to the East, we find that in the Border districts there are in all sixteen washeries, which employ about 480 to 500 hands during the busy season. Near Cape Town, proportionate to the smaller supply of wool, only three establishments are competing for the business, viz., the Zoete Inval Washery at the Paarl, the Waverley Mills and the Breede River Washery, the two latter being at Ceres Road. These washeries turn out excellent work, their output together during 1891 being over 11,600 bales.

All the Washeries throughout the Colony are worked by steam

power, excepting the Waverley Mills, which has, besides, the advantage of a turbine. The process is everywhere the same, the wool being first soaked in hot water and then rushed through cold water drums by a process invented in this Colony and called after its originator "Niven's Patent." When clean, the wool is turned out on large drying-grounds carefully paved with smooth pebbles, and the African sun gives it that brilliant whiteness for which it is famous.

The qualities of wool brought for sale are, of course, very different, according to the localities from which it comes, and according to the farmer that has raised it.

In Cape Town the principal season commences in August, and lasts until January to March. Nearly all wools coming for sale in this market are of twelve months' growth, excepting those from the agricultural and wine districts to the north-west of Cape Town. From these districts a rather common wool is brought to market, the first clip in September and October, and the second in March and April. About 5,000 bales from the grass districts between Caledon and Riversdale are brought forward during October and November, mostly fleece-washed, the remainder being wool from the Karroo districts, generally heavy in the grease and rather earthy, but free from faults, and well adapted for scouring. The western snow-whites fetch the highest prices in the London market, values at the last July (1892) sales having gone up as far as 1s. 7½d. per lb. Many of these wools are also well suited for combing. With the exception of those from the coast districts, where the fleeces are carefully tied up, the wool is generally packed loose in the bales, locks and pieces being thrown in with the good wool. The better class farmer makes an exception to this, and it is to be hoped that others will follow his example.

In Port Elizabeth, with a larger supply, there is a larger variety offering, excepting in fleece-washed, the quantity of which is insignificant. We find quotations in the price lists of scoured wool in extra super snow-whites down to country scoured and common scoured, much infested with burr and seed, of long and short "grassveld" grease, of Karroo grease well sorted long, and light, down to short and faulty, of coarse white wool and coarse and coloured, the latter classes being the product of the progeny of crosses between Merinos and fat-tailed sheep.

Of grease wool, the lighter grassveld wools, which are also stronger in staple than the Karroo wools, fetch the highest prices. They are fine enough to supply the demand for Bradford, which is for a wool that will produce a 60s. top, and they are well adapted otherwise also for the comb. For America, the yellowish

Karoo wools are mostly preferred when of good length, fairly uniform, and not too heavy. The high prices obtained for both classes act, no doubt, as a strong incentive towards the more rational system of shearing once a year only. The reason of so much short wool still coming forward lies, no doubt, mostly in the negligence, and often in the neediness, of the more ordinary farmers. By shearing twice the scab is, to outward appearance, kept under more, and twice shearing brings ready money twice a year to the farmer. In many localities, however, as in a district like from Cradock to Nauwpoort, of a high mountainous character, farmers are compelled to study the seasons, and will shear six months one year and wait, perhaps, twelve months until the next clip, a cold winter season threatening serious losses in shorn stock.

Most of the wool in Port Elizabeth is sold by private contract, but there are weekly auction sales in a large well-constructed market building, where a good deal of business is done.

In the East London exports the quality of the scoured wool, although improving from year to year, does not come up to the excellence of the more western ports, but in the quality of grease wool it bids fair to outshine the remainder of the Colony. The better class of farmers take a pride in their clips; they make it a rule to sort their wool most carefully, and ship their productions under their own names or brands. We find these clips being sold at the public sales in London (July, 1892) at from 7*d.* to 8½*d.* per lb., excellent prices considering the low state of the market. With regard to ordinary wools, this port is the market for the production of the native sheep-owners, and it is calculated that of wool grown by natives along the border and in the Transkei, about 20,000 bales pass through East London annually, 8,000 bales of which are brought on the market as fleece washed. The Transkei native wool is said to have considerably improved in quality and condition during late years, particularly in those districts in which the Scab Act has been enforced by Government. This wool from natives is all of six months growth only, and a great many, perhaps most, white farmers in the border districts shear also twice a year; but from year to year the number of those who are content to wait until the wool has attained its full twelve months length has undoubtedly increased, and the good example of the better farmers must certainly continue to act beneficially. A large proportion of the white farmers also wash their sheep before shearing them, the decision with regard to this depending mostly upon the water supply.

From Mossel Bay the exports are the production mostly of its own and the Riversdale district, and many of the clips shipped

fetch the highest prices in London, owing to their fineness and strength of staple, the intelligent breeders in these districts having understood how to preserve these qualities in their sheep.

A great deal of the wool from the Cape is shipped to the United States, and a considerable quantity goes to the Continent, but most is sent to London and sold in those remarkable public auctions where the buyers from all quarters of the world meet to compete, and where shippers may depend upon getting the full market value for their wares.

Although the Colony has made good strides in the production of the raw material, it has done little towards turning its wool into use for wearing apparel. There is scarcely a woman in the country who understands spinning the wool grown on her sheep into yarn for hose or jersey, and in the towns there are no hand spinners or weavers. The Legislature, some years ago, made provision for the promotion of Colonial industry by offering amounts of money by way of bonuses when a certain quantity of material had been produced. A factory for tweeds was started in Grahamstown, but after struggling along until it earned the bonus offered by Government it had to succumb for want of means. At the present time the only factory in existence is one connected with the Waverley Mills, which transforms the common white and coarse and coloured wool into very serviceable and strong blankets. We may regret having to send our wool to Europe and having to receive it back in the shape of manufactured material at a manifold increased cost, but it is the regret of the school-boy who is not allowed yet to participate in the pleasures and pursuits of his elders. Up to the present, life in the Colony is easy and free from serious trouble, and we may be content at finding our sustenance on the broad roadways of production of raw material.

The writer of this article has to thank Messrs. Malcomess & Co., King Williamstown, and Messrs. Scholcsfield & Co., Port Elizabeth, for much valuable information.



[To face page 323]

HABKLY WEST, VAAL RIVER DIGGINGS.

CHAPTER XV.

THE DIAMOND MINES.

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DURING the four centuries which have elapsed since the Portuguese sailors, steering south in search of the sea route to India, first sighted the Cape of Good Hope, it may safely be asserted that no more important event has happened in South Africa than the discovery of the first diamond by Mr. John O'Reilly, in the month of March, 1867. The beneficial effects of that discovery are apparent to-day in every corner of South Africa. It has spread new life and energy through all the States and Colonies, which five-and-twenty years ago were in a languishing and impoverished condition; and has converted what were the most despised possessions of Britain into sources of revenue to the mother country, and fields of ever widening enterprise for her sons. It may even be added that but for the discovery of diamonds, the countries to the northwards would probably still have remained in undisturbed possession of the native, with a sprinkling of Boer farmers, traversed occasionally by a stray trader or hunter, whose accounts of reputed mineral wealth, and of rich pasture and agricultural lands would have continued to be received with smiling incredulity. Even after the Transvaal Gold Fields had been discovered, years passed with only a feeble and unsuccessful attempt at exploration; and it was reserved for the energy and capital of Kimberley men to develop the wealth of the Rand Mines, and to penetrate the Dark Continent north of the Limpopo.

The history of Mr. O'Reilly's discovery of the first South African diamond is too well known to need a detailed repetition. In March, 1867, he was returning from a hunting-trip across the Vaal River; and resting for the night at Schalk van Niekerk's farm, "De Kalk," in the Hopetown district, he noticed a beautiful lot of river pebbles on the table, out of which he picked the "first diamond." Neither the hunter, nor the farmer, was aware of its value. Arriving at Colesberg, Mr. O'Reilly showed it to the Acting Civil Commissioner, Mr. Lorenzo Boyes, who, finding

that it *cut glass*, asked Mr. O'Reilly to let him send it to Dr. Atherstone, at Grahamstown. Several Jews at Hopetown and Colesberg had pronounced it to be a topaz, and worth nothing. Dr. Atherstone replied, "I congratulate you on the stone you have sent me. It is a veritable diamond, weighs $21\frac{1}{2}$ carats, and is worth £500. It has spoiled all the jewellers' files in Grahamstown; and where that came from there must be lots more."

Europeans and natives commenced to search the country near the reported scene of the first discovery, but their success was so small that for another two years the existence of diamond fields in South Africa continued to be disputed. However, in 1869, Mr. Van Niekerk secured from a Griqua Hottentot a large stone for which he gave the sum of £400, or live-stock to about that value, and which he sold directly after to Messrs. Lilienfeld of Hopetown for over £10,000. This was the famous "Star of South Africa." It weighed $83\frac{1}{2}$ carats in the rough, and was estimated in June 1870, to be worth £25,000. It has been cut, and now figures amongst the jewels of the Countess of Dudley, its present weight being $46\frac{1}{2}$ carats.

When it was clearly authenticated that a gem of such value had been found, the first large "rush" of diggers made their way up to the Orange River, but it is a curious fact that though the earliest finds were in the Hopetown district no mine has been discovered there. However, careful prospecting soon proved that diamonds were to be found along the banks of the Vaal River. The searching parties worked their way from the junction of the Orange and Vaal up the latter stream as far as Hebron, leaving detachments of diggers along the whole course. In 1870 a large population numbering not less than 10,000, chiefly males, had spread itself along the Vaal River, constant recruits arriving from all parts of South Africa, with a goodly sprinkling of Yankees and other keen-witted miners, who brought to bear on the new industry their valuable experience gained in California and Australia.

In the latter part of 1870 news came of the discovery of diamonds some twenty miles further south, about midway between the Vaal and Modder Rivers, near to where the town of Kimberley now stands, and many of the River Diggings were soon abandoned by the rush to the farms of Dutoitspan and Bultfontein. The improvement was not very encouraging. Neither the river diggings nor the newly opened mines were sufficiently rich to prove remunerative to so large an influx of workers with the primitive appliances at their disposal, whilst the change from the green banks and shady trees of the limpid Vaal to the arid sand of Dutoitspan, where water even for domestic purposes was almost

a luxury and at times quite unobtainable, was not conducive to cheer the spirits of men whose hopes of speedy fortune had been rudely disappointed.

Hardly a more dreary existence can be imagined than that of the early days on the Diamond Fields. Comforts there were absolutely none. Not a single substantial dwelling afforded shelter from the burning sun: men lived under canvas, and the owner of an iron or wooden shanty was looked upon as a lord. If you crossed the street you trod ankle deep in sand, and probably before reaching the other side a small dust storm in embryo had choked and blinded you. The dust and the flies, and worse, pervaded everywhere; they sat down with you to meals and escorted you to bed. The want of good food and pure water brought on disease, and many a poor fellow who had expected to find an Eldorado on the fields succumbed to the fever which threatened to become endemic. Yet the men who had subjected themselves to this sort of life were mostly fresh from the comforts of civilization. There was an entire absence of the rowdy uncouth class such as peopled the "Roaring Camps" of the far West. The expense and difficulty of reaching the Diamond Fields, even from the nearest towns of the Cape Colony, kept rogues and loafers out of the place. Though distant only 650 miles from Cape Town, and 500 from Port Elizabeth, the journey from the latter port occupied a month and six weeks from the former. It had to be performed in a springless transport-wagon, drawn by ten to sixteen bullocks, over roads that no description could convey the vileness of, and the cost per passenger was not less than fifty pounds.

To-day all this has been changed. The railway has placed the Diamond Fields within thirty hours journey of the coast ports; and brings to them a daily supply of all the luxuries the Colony can produce. The township has been drained, paved, and lighted with electric light, as well as furnished with an ample water supply, and the public health has so greatly improved that the fatal "camp fever" is a thing of the past.

Early in the year 1871 a new digging was discovered two miles distant from Dutoitspan, in a north-westerly direction, situated on a farm named Vooruitzicht, the property of one De Beer, from whom it was termed "Old De Beer's." And on this same farm, in July, 1871, the famous "Colesberg Kopje" or "De Beer's New Rush," as it was variously called, was discovered by a Mr. Rawstorne of Colesberg. By a Government proclamation issued three years later, (see Statute Law of Griqualand West, No. 7 of 1874) these diggings were converted into "Mines" with the respective titles of "Dutoitspan Mine," "De Beer's Mine," and

"Kimberley Mine." The "Bultfontein" diggings were not proclaimed a mine till 1882. The three farms containing these four mines changed hands very shortly after the opening of the diggings. Dorstfontein, the farm on which the Dutoitspan Mine was situated, was owned by one Van Wyk, whilst the neighbouring farm of Bultfontein belonged to another Dutchman named Du Plooy. The owners had at first issued "briefjes," or licences to dig, at a trifling charge, but the growing number of diggers soon proved too great for their pastoral tastes, and both owners disposed of their property to Mr. H. B. Webb, through whom it eventually passed into the hands of the London and South African Exploration Company. The Vooruitzicht estate was similarly purchased from its owner, De Beer, by a Port Elizabeth firm of merchants, for the sum of £6,000, and resold by them to the Colonial Government in 1875 for £100,000.

The diamondiferous area at the present time is defined on the north, west, and south by the wide fork formed by the junction of the Vaal and Orange Rivers. Although the first diamonds were found a few miles south of the Orange River, and alluvial diggings are still being worked on the northern bank of the Vaal, there is no evidence for believing deposits of diamonds to exist north of the Vaal or south of the Orange River. All the known diamond mines and diggings are contained within the square formed by the 28th and 30th parallels, and the 24th and 26th degrees of longitude. The town of Kimberley is situated in about the centre of this square, and the boundary line of Griqualand West and the Orange Free State forms almost a diagonal across the square from north-east to south-west. It will thus be seen that the Kimberley Mines are practically in the centre of the diamondiferous area, and from these *four mines* more than *ninety per cent.* of all the diamonds exported from South Africa have been raised.

The locality of the Diamond Fields would hardly be chosen as a desirable residence by any one not in search of diamonds, or unconnected with the industry. The region may almost be described as a desert, destitute of trees or foliage, a wide expanse of rolling plains, unrelieved by any eminence worthy of the name of hill; without rivers, or water in any shape, always excepting the Vaal, which is fourteen miles from Kimberley. Owing to the altitude (4042 feet above the sea), and the absence of vegetation, the climate is extremely dry, and though heavy rains fall in the summer, six or eight months sometimes pass without a single shower, so that dust storms are of frequent occurrence, and the verdure of the veldt is painted an undistinguishable brown. From September to March the heat is excessive, often 100° in the shade,

though on account of the dryness of the air, this temperature is much less trying than it would be at the coast, and the nights, even in midsummer, are invariably cool and pleasant in spite of the mosquitos, which have only visited the fields since the advent of the railway. The winter climate is delicious, mild bright days and frosty nights, with very rarely a fall of snow. When every deduction is made, the wide open country and the vast blue sky have a charm which grows upon one, and in spite of the drawbacks mentioned the climate is far from unhealthy.

The town of Kimberley still bears marks of the old diggers' encampment out of which it has grown. The early diggers, who still speak of it as "the Camp," lived in tents; and when they migrated into nobler edifices of galvanized iron, the streets were not laid out with much regard to regularity. Indeed, the tin houses were frequently moved from one spot to another, and it is still no unusual sight to see a house being carted down the street, or carried, walls and roof intact, by a gang of natives. During the last ten years, however, comfortable brick houses have been built, furnished with every modern luxury; and since the Vaal River water has been brought into the town by the Kimberley Waterworks Company, gardens have been laid out, trees and orchards have been planted; so that many portions of the town and suburbs present a very bright and pleasing appearance to travellers arriving from the monotonous journey through the arid Karroo. There are no imposing public buildings in Kimberley, but many visitors have carried away a pleasant impression of the Kimberley Club and the Public Library, which are quite equal to any similar institutions in South Africa. The population in 1891 was 28,718 persons.

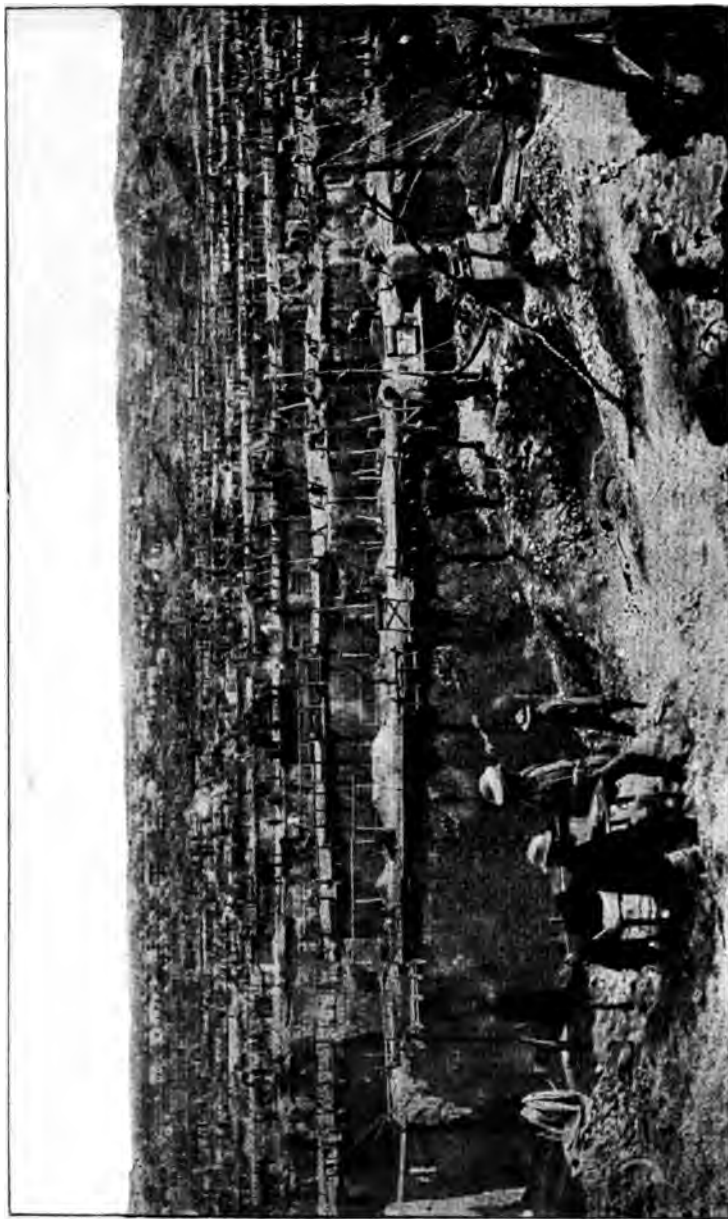
The township of Beaconsfield, whose population numbers another 10,478 persons, is situated two miles to the south-west of Kimberley, with which it is connected by tramway, and by the main line of railway from Capetown.

The Diamond Mines are contained in the shale and sandstone formation known geologically as the Lower Karroo Beds. They may be described as large pipes or funnels of unknown depth, and more or less oval shape, several acres in extent. They are probably extinct craters which have been filled from below by volcanic mud at a time when the surrounding country was under water. In support of this theory it may be stated the diamond-bearing rock filling the pipes contains fragments and boulders, or large floating masses, of all the encasing rocks, as well as pieces of older and lower-lying rocks, such as granite or gneiss, which have not yet been pierced by the deepest shafts outside the mines. The softer rocks (shales) surrounding the pipes near the surface have

their exposed edges turned upwards, as by a pressure from below, and the funnel itself is much more conical at the surface than in the harder rock beneath the shales. Though the mines occur in groups confined within a few square miles of country, each mine differs from its neighbour, both in the appearance and composition and physical nature of the diamond-bearing rock, as well as in the quality of the diamonds themselves; and similar strongly marked differences exist even in different parts of one and the same mine, from which it would appear that the breccia filling the pipes has been deposited by a succession of upheavals. The first mines were discovered by diamonds lying on the surface in the red sand, and subsequent search disclosed numbers more in a similar position; but no diamonds were found in the surrounding country immediately outside the margin of the mines. The evidence of the volcanic origin of the mines may therefore be regarded as complete.

The question as to the manner in which the diamonds themselves were produced is much more difficult to solve. They have evidently not been formed in the precise positions they now occupy, since fragments of broken diamonds are frequently met with; but, on the other hand, from the distinctive character of the diamonds in different mines, we must infer that their origin cannot have been very far distant from the spots where they are actually found, though they have certainly come from a very great depth. The diamond is known to be pure carbon, and before it was ascertained that the mines extended far beneath the level of the black shales, it was conjectured that in passing through these carbonaceous shales the diamonds had been formed by chemical action due to the steam generated in the volcanic rock. It is evident now that the diamonds are of older date than the rock in which they are found, but the mode of their formation still remains a mystery.

The surface of the mines, in common with the surrounding country, is covered by a few feet of red sand, followed generally by a somewhat thicker deposit of lime. Underneath this the true diamond rock is reached. The yellow ground extends to a depth of 50 to 60 feet. The depth of the blue ground is unknown. It has been tested in Kimberley Mine to a depth of over 1200 feet beneath the surface, and may be regarded as practically inexhaustible, since the encasing rocks are almost vertical in the lower depths. The surface shales and basalt surrounding the pipes are called "Reef." It is important to remember that in diamond-mining this term is applied to the *casing* only, and not to the rocks carrying the diamonds. In the upper levels of the mines intrusive masses of shale and



THE ROADWAYS, KIMBERLEY MINE, 1872.

[To face page 322.]

igneous rock are met with, called "Floating Reef." They are destitute of diamonds, and sometimes cover an area of several thousand square feet, but they disappear in the lower depths. Smaller dykes of igneous rock also occur. The ground is generally richer in diamonds in the neighbourhood of these dykes and intrusive sheets, or immediately beneath them.

The Kimberley mine was thrown open on the 21st of July, 1871, a red-letter day in the annals of South Africa, since it practically inaugurated the era of profitable mining, on which the country mainly depends for its subsistence, and to which it owes its growing importance amongst the rising states of the world.

In the face of a good deal of opposition from the diggers, the Government (Orange Free State) Inspector of Mines wisely decided to lay out the mine on a new plan. Instead of allotting the whole area within the mine to be worked as the diggers thought fit, he insisted on a reserve strip off one side of each "claim" being left unmined to form roadways. The size of a claim in Kimberley Mine is a square measuring 31 ft. by 31 ft., the mine itself forming an irregular ellipse, of which the major axis points approximately east and west. The roadways were made to run parallel with the claim-lines across the narrower width of the mine from north to south, and each roadway was 15 ft. wide, half of this width being taken alternately from the east and west of successive claims, leaving a space of 47 ft. between the several roads, so that each claim-holder lost temporarily a strip of $7\frac{1}{2}$ ft. off one side of his claim, or one quarter of his holding. This loss of ground was more than compensated for by the extra facilities for working afforded by the roadway.

Though there were only about 500 claims in the mine the precise limits of the claim-ground could naturally not be determined before the mine was opened, so that a much larger number of claims was originally allotted than the mine actually contained, even on the surface, and the claims abutting on the "reef" were soon cut out by the conical shape of the mine. But the demand for claims was so great that they were subdivided, first into halves and quarters, then down to eighths and sixteenths, the latter holding comprising no more than *five square yards* after deducting the reserve for roadway. By law no individual could hold more than two claims, and the "blocking" of claims was also prohibited, so that an immense number of independent claim-holders was the result, the mine being split up into no less than 1600 separate holdings. Of course this state of things could not last long, and a process of consolidation soon began, accompanied by a rapid rise in the market-value of the claims. Many diggers who had only paid the customary

licence of 10s. per month for their claim disposed of it for over £100, and the value went on increasing from month to month, as the richness of the mine became more and more evident, till ten years later claims changed hands at £10,000 to £15,000 each, and even at these prices have yielded huge profits to the purchasers.

There were fourteen or fifteen roadways in all, numbered from east to west, and the names of them still survive for convenience of defining different sections of the mine, though every vestige of them has long since disappeared. As early as the beginning of 1872 the roadways began to be unsafe; whether from design or accident, it frequently happened that masses of the high ground subsided, leaving great chasms in the roads which had to be bridged over by the owner to enable the traffic to go on; and by the middle of the year the number of these slips had increased so much that it became evident that some change in the system of working was needed; but whilst men were wondering what it was to be, the remaining solid portions of the roads collapsed converting the whole works into ruins. Some of the diggers were in despair, and sold out at once, thinking the mine could never recover from such a disaster. But it was only the first of a series of unanticipated mishaps that Kimberley Mine has experienced, and that almost any less rich property would have succumbed under.

It is to be regretted that no statistics have been preserved of the number of workers employed in the mine at this period. It can hardly have been less than 10,000 or 12,000, and is estimated by many at double that number. The problem, now the roadways had collapsed, was how to work the large number of separate holdings, so as to preserve free access to each, and still let no claim-holder encroach or trespass on his neighbour's ground. As the claims deepened, a system of rope haulage had been adopted; a couple of grooved wheels being fixed, one on the surface, the other in the claim, whilst to the rope passing over these wheels the bucket was attached, which was filled with ground in the claim and hauled up and down by a handle on the upper wheel. The objection to this method was that the entire circumference of the mine did not afford frontage enough for the erection of a hauling-gear to each claim, and further that, even had the frontage sufficed, the crossing of ropes would have been a serious difficulty.

Both these difficulties were overcome by the following ingenious arrangement. A succession of tall massive timber stagings was erected round the margin of the mine. Each staging carried two or three platforms one above the other, every



THE KIMBERLEY MINE, WITH CROWD OF WIRE ROPES IN 1873.

[No face page 331.]

platform serving as an independent level from which to communicate with the claims below. Stationary ropes were then stretched from the different levels of the stagings to the claims, the ropes being anchored to the ground at both ends; the upper platforms communicated with the claims in the centre of the mine, the lower platforms with those nearer the margin. The hauling ropes were attached to windlasses worked by Kafirs on the several platforms, on which grooved guide-wheels for the ropes were also fixed, the buckets being swung from the stationary ropes by little overhead runners and crooks. The buckets most generally used were constructed of hide, as being more durable than the common iron buckets, and the ropes were often made of twisted hide, till the introduction of iron and steel wire ropes gradually superseded them. Arrived at the level of the platform, the bucket was tipped into a narrow shoot, down which the ground ran into a bag held ready to receive it, in which it was conveyed away to be sorted. The din and rattle of these thousands of wheels, and the twang of the buckets along the ropes were something deafening, whilst the mine itself seemed almost darkened by the thick cobweb of ropes, so numerous as to appear almost touching one another. This mode of haulage, of which the annexed illustration conveys an idea, continued in vogue during the whole of 1873, and if the appearance of the mine was less picturesque than whilst the roadways existed, it was if anything, more unique. By moonlight, particularly, it was a weird and beautiful sight.

The year 1874 witnessed the establishment of the first Kimberley Mining Board, the internal affairs of the mine having been previously managed by a Diggers' Committee. The excavations by that time were over 100 feet deep, and with the increasing depth many unforeseen difficulties arose, which the newly constituted Board had at once to grapple with. The first of these difficulties was an accumulation of water in the lowest workings, then the encasing rock of the mines (or the "Reef," as the diggers called it) being exposed by the removal of the diamondiferous ground, began to disintegrate and fall into the mine. Claim-holders in the centre of the mine generally suffered most from the water, those near the margin were most troubled by the reef; but it soon became a recognised principle that both reef and water should be treated as common enemies, and accordingly a general rate was levied on the whole mine to deal with them. The water difficulty would never have been serious had anything like adequate pumping machinery been provided, as no strong springs were met with in the workings, and it was mainly surface drainage that had to be dealt with.

Much more serious have been the reef troubles, forming a long chapter of accidents in themselves, which more than once threatened to involve the whole mine in ruin; and though all this is now ancient history, no account of the diamond industry would be complete that did not devote some space to the reef question, which was once so all-engrossing in Kimberley.

Early in the year 1878 one quarter of the claims were covered by reef; this was being hauled out at a cost to the Board of 4s. per load of 16 cubic feet. In the years 1879 to 1880 the Board's expenditure on the removal of reef, débris, and water exceeded £300,000, although the reef tariff had been reduced from 4s. to 2s. 6d. per load. At the end of 1881 the Mining Board had 7 miles of tramway in use, whilst another 12 miles had been laid down by claim-holders. During that year the Board expended over £200,000 in reef removal, but the work had been commenced too late to be effective, the slips became ever greater, so that in 1882 more than *half a million sterling* was needed to defray the cost of the reef actually removed, and still claims were covered and other slips impending. The bulk of this removal had been done by the claim-holders themselves at the Board's expense. Notwithstanding all these appliances, the reef removal did not keep pace with the constantly recurring slips, and during the following eighteen months the reef hauled by claim-holders alone cost the Board over £650,000. Unable to meet this heavy expenditure by cash payments, the Board had recourse to bills, with the result that by the end of March, 1883, its books showed a deficit of over a quarter of a million sterling. The local banks refusing then to discount its reef bills any further, a financial crisis arose, causing a dead-lock in the operations of the mine. Outsiders freely stated that Kimberley Mine was ruined.

The dilemma was really a most grave one. The financial position of the Mining Board rendered a continuance of heavy reef-work in the absence of outside assistance impossible. Still less could any individual claim-holders contemplate reaching their submerged ground by means of tunnels connected with shafts sunk outside the mine; the expense of boring through the "hard rock," besides being too costly, was too lengthy an operation to afford the speedy relief that was needed. At this juncture Mr. Edward Jones, a mining engineer who had been conducting large reef contracts for some time previously, propounded a scheme which, though startling in its novelty, and poohpoohed by most practical miners at the time, was shortly afterwards carried into effect by the inventor at his own risk, and which actually enabled the mine to tide over its gravest difficulties.



W. H. D. D. D.
KIMBERLEY MINE UNDER REEF IN 1886, SHOWING CRATER-LIKE FORMATION. [To face page 333.]

The question was, how to get out diamondiferous ground at once without the prosecution of further dead work.

Mr. Jones solved the problem in the following manner:—A shaft was sunk *inside the mine* through the fallen reef on the “cofferdam” principle of gradually lowering a square timber box, without bottom, through the loose stuff, shovelling out the reef from the inside, and fixing on box after box to the first one, till it had sunk to the bottom of the fallen reef, forming a strong timbered shaft within the latter, and resting at last on the solid blue ground. In this mode more than fifty feet of loose reef was successfully sunk through, after which the shaft was easily extended to any desired depth into the “blue,” and tunnels were driven in all directions, so as to continue the excavation of the mine under ground. The great merit of the scheme was that it entailed little initial outlay, whilst as soon as the “blue” was reached, the work of opening up the galleries more than paid for itself in the value of the diamondiferous ground removed, which was reached within a few months after starting the shaft.

By the end of 1882 the deepest open workings in the blue ground of Kimberley Mine were over 400 feet beneath the surface; and they never much exceeded that depth, since it gradually became evident that the task of keeping the claim ground clear of reef was beyond the means of even the wealthiest companies then owning the richest portions of the mine. Some four million cubic yards of reef had been removed in all, at a cost of something like two millions sterling, and yet the Inspector of Mines had to report that out of the 300 or 400 claims in the mine “only about fifty claims have been regularly worked during 1884.” Though profitable mining was being carried on from the shafts sunk through the fallen reef, attempts were still made to revert to open working, which ruined both systems, as hauling reef from the foot of the slopes caused a further subsidence, which carried away these shafts and destroyed many thousand pounds’ worth of machinery and plant used in connection therewith. In each of the years 1883 to 1885, the quantity of blue ground raised from Kimberley Mine was little over 300,000 loads, as against a million loads raised in 1882, which practically demonstrated that mining in the open could not be conducted below a depth of 400 feet, and that the only alternative was some system of underground mining.

The experience gained at such great expense in Kimberley Mine was naturally made use of to avoid similar mistakes in De Beers Mine, in which the expenditure on reef-work has been comparatively insignificant. For the first few years after its

discovery little attention was devoted to this mine, owing to the greater richness of Kimberley Mine on the surface; but when the reef-troubles in the latter mine became so serious as to render a large amount of capital necessary for coping with them, mining at De Beers was energetically resumed. The hard basaltic rock overlying the shales stood remarkably well when exposed, so that for several years very little trouble was caused by falls of marginal or "main-reef," which was cut back in terraces as it became dangerous, thus keeping the claims generally clear of reef. In the years 1878 to 1882 inclusive, the De Beers Mining Board had removed over 215,000 cubic yards of reef at a cost of £76,000, being much less than the average cost of similar work in Kimberley Mine, where the bulk of the reef had to be hauled out after it had fallen into the claims. But as the mine grew deeper year by year, the amount of dead-work to be done rapidly increased. In each of the years 1883 and 1884, over 70,000 cubic yards of reef were removed, and yet in the early part of 1885 such considerable falls of reef took place that the Board determined to cease reef-hauling altogether, as certain in the long run to bring disaster on the mine. The deepest open workings had by that time reached a depth of about 350 feet below the surface, and the richness of the blue ground over a great portion of the mine had been proved to be almost equal to that of Kimberley, but still there was much hesitation and timidity about resorting to underground mining.

In both mines, as already mentioned, there is a great difference in the relative value of the ground in different parts of the mines—the claims in the west end of both mines being not payable, whilst those in the east, north, south, and centre are exceedingly rich, though showing again minor variations to a considerable degree. The west end of De Beers Mine had remained a high bank of unworked yellow-ground, and a few weeks after the reef-fall referred to above, some 300,000 loads of this high yellow-ground fell in one day, filling up the whole of the lower blue-ground workings, and actually overlapping the foot of the reef, which had fallen from the east of the mine, so that for the next six months profitable work in the open was suspended till this rubbish could be cleared out.

Prior to the great falls of reef and yellow ground in the beginning of 1885, a move had been made towards inaugurating underground mining, on a more ambitious plan than that adopted in Kimberley Mine, by means of a large circular shaft, sunk some 1000 feet to the north of the mine. This shaft was commenced in 1884, and carried down 320 feet, and then abandoned in favour of an inclined shaft, sunk about 150 feet west of the claim

margin, at an angle of 56° with the horizon, so as just to cut through the edge of the "hard rock," and thus avoid the great expense of sinking and driving through the amygdaloid. At the same time mining in the open was still proceeding, but by the end of 1886 the reef-falls had become so serious as to render a continuance of this system hopeless. By that time the greatest depth in the open workings was 400 feet, and in underground mining 650 feet, and in the course of the following year the latter system was universally adopted, and all idea given up of attempting to remove the marginal reef and high yellow ground, which have since been allowed to slide into the mine where they have long since covered every vestige of the old open workings.

The formation of Dutoitspan Mine is similar to that of Kimberley and De Beers, but owing to its much greater size and the inferior richness of the ground, it has not reached the same stage of development, nearly all the work having been done in the open. The encasing rocks consist of yellow and black shales, the latter of unknown depth. For the first five or six years after its discovery this mine was only spasmodically worked, and the results were so little encouraging that in 1874 most of the diggers left Dutoitspan, to work "débris" at Kimberley, and in the following year the mine was almost completely deserted. In 1876 the débris-washers returned, took out fresh claims, and by degrees introduced improved hauling and washing machinery, so that the mine rapidly grew deeper; but as the ground was not rich enough to pay for much dead-work, a buttress of unexcavated blue-ground was generally left as a solid support against the reef, and served to stave off the evil day for a number of years. A disastrous reef-fall, however, took place on the 18th of March, 1886, by which eight white men and ten Kafirs were killed. Surface-cracks had been noticed in the northern margin of the mine for 18 months previously, but not sufficient attention was given to the signs of impending subsidence. On the day in question all the workers were supposed to have left the mine at noon, and the blasting had commenced, when a huge mass of reef and solid blue-ground detached itself from the almost perpendicular side of the mine, and curling bodily over, fell with a crash like an avalanche into the workings below. Unhappily a party of miners had taken shelter during the blasting in a pumping-engine house at the bottom of the mine. The house was completely wrecked by the falling rock, and the unfortunate eighteen men were either crushed or scalded to death. The fallen mass was estimated at 100,000 cubic yards, of which about one-third was blue-ground.

This was the first serious reef-fall in Dutoitspan Mine, and was followed at intervals by others, till at the present time nearly all the old open workings, which by the end of 1887 had attained a depth of 400 feet, are covered with reef. In this mine, too, there are considerable masses of floating reef and high poor ground, which divide the mine into a number of gullies, in some of which the accumulation of water has at times converted a large area of claim-ground into temporary lakes.

The history of Bultfontein Mine is not unlike that of Dutoitspan. For the first ten years it was worked by means of inclined roadways and bullock-carts, but from 1880 onwards the erection of powerful hauling machinery enabled increased quantities of "blue" to be excavated, and by the end of 1887 the deepest workings had reached a depth of 460 feet, probably the greatest depth ever reached in open workings in any of the mines. A plucky attempt was made by one of the companies to avert the inevitable fall of the reef by cutting it back in terraces, but the work was commenced too late, and confined to only one corner of the mine; the forces of Nature slowly but surely prevailed against the exertions of man, and by the middle of 1889 nearly the whole of the deep claims were covered by reef, and by the end of that year only four hauling gears were still working out of more than thirty that had been at work in 1882. Bultfontein Mine has always been exempt from any troubles with water in the claims, but a considerable area is covered by large blocks of floating reef.

It has been shown how in each of the four mines the difficulties of mining increased with increasing depth, requiring constantly larger capital and more elaborate appliances for winning the diamonds. As a natural consequence the individual digger, who had held his one or two claims and been able to work them at a profit whilst near the surface, was soon compelled to sell out, or to amalgamate with his neighbours. With a laudable desire to allow as large a population as possible to acquire separate holdings in the newly discovered mines, it was originally decreed that no individual should hold more than two claims, and the "blocking" of claims was also prohibited. But as early as 1874 it was found necessary to permit as many as ten claims to be held by a single digger, and even this restriction had soon after to be repealed, as it was found impossible in many cases, particularly in the two poorer mines, to work so limited an area at a profit. As a consequence the "original digger" gradually gave place to a comparatively small number of capitalists, who by the end of the "seventies" had acquired the richest portions of all the mines, and much of the poorer ground also.

Though many of these individual claimholders and private firms, in Kimberley and De Beers at all events, were realizing handsome profits, the growing need of working on a more extensive scale naturally suggested the formation of companies with increased capital so as to deal with the large amount of dead-work which had to be carried on simultaneously with the mining in payable ground; and thus in the years 1880 and 1881 most of the private holdings in the four mines were converted into limited liability companies. In many cases the capital at which these properties were floated was fully justified by the intrinsic value of the claims. In too many others the *claim* capital was much too high, whilst the *working* capital provided was ridiculously small; insufficient, in not a few instances, to pay for the necessary machinery and initial expenses, so that many companies found themselves heavily in debt before they had fairly started work.

But a speculative mania had taken possession of the public, and mining scrip was regarded as a sure passport to wealth. One has almost forgotten the names of all the companies whose glowing prospectuses figured in the daily papers in those days of sweet but short delusion. Within the space of a few months the promise of certain fortune to investors was held out by more than a hundred Diamond Mining Companies, and it rarely happened that any of these failed to be floated, or their shares to be rushed up to a big premium. The eagerness to be "in the swim" silenced every prompting of prudence: clerks threw up their situations, merchants left their stores, and professional men their duties, to hang about street corners and dabble in stocks, of the real value of which they were generally profoundly ignorant. Three or four years of considerable commercial prosperity had made money plentiful in the colony, but it was speedily all gambled away. So great was the demand for fresh stocks that claims which were known never to have paid for working were floated almost as easily as the richest proved properties. Nor was this speculation by any means confined to the old established mines. The number of "Kopjes," the number of "Fonteins," the number of "Pans" and "Dams" that were suddenly discovered to be rich in diamonds, has almost faded from our memory. But the swift retribution which followed has not been forgotten, nor is it likely to be, by those who passed through the succeeding years of depression. We had converted all our available cash into paper, and suddenly the paper was found to be "not negotiable," and of course, when the bubble burst, the really genuine concerns suffered with the rotten ones. For the next three or four years, investors were as hard to convince of the value of our

mines as they had previously been recklessly eager to buy into them.

The immediate result of the formation of Companies was to greatly increase the output, with the aim of paying dividends on the enhanced capital of the mines. From having been little over two million carats in 1879, the production of diamonds for each of the years 1880 and 1881 rose suddenly to over three million carats, so that the mines became rapidly deeper, and the difficulties of working a single mine harmoniously by a number of different proprietors grew more palpable every year. There were constant disputes and costly law-suits between the several claimholders, or between these and the Mining Boards, often resulting in awards for enormous damages; and as early as the beginning of 1883 the Inspector of Mines, in his Report on Kimberley Mine for the previous year, informed the Government that "it is daily becoming more evident that this mine, especially, can never be worked to the best advantage until all the payable holdings have been amalgamated and the whole mine worked as a single holding." Kimberley being the smallest and deepest of the four mines, this state of things was reached there soonest, but the conclusion forced upon an impartial and competent observer of Kimberley Mine was admitted to be applicable to the other mines by those most interested in them. If this was true in the days of open workings, it left no room for doubt after the underground works had been started, which rendered it more difficult than ever for neighbouring claimholders not to hamper and hinder one another. In both Kimberley and De Beers Mines six or eight different shafts had been sunk, some inside, some outside, the mine, connected with tunnels, galleries, and passes, worked on half-a-dozen systems. In 1885 there were four different systems of underground mining in vogue in Kimberley Mine, and, apart from the inconvenience of this, the waste of money to the mine, regarded as a single property, was almost incalculable. The far-seeing directors, therefore, in both mines, began early to impress on their shareholders the importance and advantages of amalgamating adjoining blocks, with the ultimate view of converting the whole mine into a single company. The process, however, was both long and tedious, necessitating endless discussion as to the relative value of the different properties concerned, and it was only by slow degrees that first one bit of ground, and then another, was welded on to that of a richer neighbour, so that every year the number of separate holdings grew less and less. What a Herculean task was involved in this project will be realized when it is mentioned that by the end of 1885, after considerable progress had been made in amalgama-

tion, there were still no fewer than 98 separate holdings in the four mines. Of these 42 were Companies, and 56 private firms or individuals. In Kimberley there were 11 Companies and 8 private holders; in De Beers, 7 Companies and 3 private holders; in Dutoitspan, 16 Companies and 21 private holders; and in Bultfontein, 8 Companies and 24 private holders. The total claim area leased in the four mines was 3238 claims, equal to only $68\frac{1}{2}$ statute acres: yet the assessed value for rating purposes was over five millions sterling, equivalent to an average of £75,000 per acre, and the market value of course was considerably higher.

It will be seen from the above figures that the greatest progress in amalgamation had been made in De Beers Mine, where the number of separate holdings had been reduced to seven Companies owning the whole mine, with the trifling exception of nine claims held by three private diggers. The most important of these Companies was the *De Beers Mining Company*. Founded on the 1st of April, 1880, with a capital of only £200,000, it had by degrees absorbed most of its smaller neighbours, till by the end of March, 1885, its capital stood at £841,550, on which during the last financial year it had paid a dividend of $7\frac{1}{2}$ per cent., the largest dividend thus far earned by the shareholders. In the three following years the policy of amalgamation was not only steadily pursued, but expanded into a broader scheme for uniting the principal holdings in all the mines into one powerful corporation, which should control the whole of the diamond industry. By the end of 1887 the amalgamation of De Beers Mine was complete, and controlling interests had been purchased in each of the other three mines. At the close of the financial year ending 31st March, 1888, the capital of the Company stood at £2,332,170, and the increased dividends that had been paid during the last three years fully justified the directors in expecting the approval of their shareholders for their bold exercise of the powers vested in them under the trust deed. The dividends for 1886 were 12 per cent.; for 1887, 16 per cent.; and for 1888, 25 per cent., in each case for the year ending 31st March. During the eight years of the Company's existence, the total dividends paid had exceeded a million sterling, being $71\frac{2}{3}$ per cent. on the figure at which the capital had successively stood, and in addition to these dividends, 41 per cent. had been distributed in bonus shares. Two very gratifying circumstances had contributed towards the improved position of the Company: first, a very marked improvement in the value of the "blue"; and secondly, a great reduction in the cost of working. In 1881, the "blue" had only yielded $\frac{1}{60}$ ths of a carat per load, and in 1882 only $\frac{1}{70}$ ths carat, whilst the working

expenses had amounted to 13s. 2d. per load, so that in that year it had cost 16s. 6d. to produce a carat of diamonds. In 1887, the average yield was 1.15 carat per load, and the cost of production 8s. 2d. per load, equivalent to 7s. 2d. per carat, so that in those five years the yield had improved over 40 per cent., and the cost of production been reduced nearly 40 per cent. In the former year a dividend of only 3 per cent. had been paid; in the latter year the dividend was 16 per cent. And yet in the meantime there had been a most serious drop in the selling price of diamonds, namely, from 27s. 3d. per carat in 1882 to 18s. 5½d. in 1887.

No better proof could be afforded of the benefits resulting from amalgamation than the foregoing figures. It is well known that the mine had grown richer as it grew deeper, but this greatly improved yield was partly due to better management and to the stronger financial position of the Company, which enabled a large reserve of "blue" to be kept on the floors, thus ensuring the ground being thoroughly pulverized before it was washed. At the end of 1882 the De Beers Company had only 3000 loads of blue on the floors; at the end of 1887 they had nearly 300,000 loads on the floors. The improved yield is also partly attributable to the better precautions taken against theft of diamonds by the introduction of the "Compound" system, which secured complete surveillance over the native labourers. The great reduction in working expenses was mainly due to the much larger scale on which operations were conducted as the size of the property increased. From having treated less than 100,000 loads in 1882, nearly 500,000 loads were washed in 1887; or, in other words, whilst the capital of the Company had been barely doubled, the amount of profitable work performed had increased five-fold.

But this satisfactory improvement in the cost of production and in output was not without its attendant dangers. In the days of open workings the mine had never been able to produce more than half-a-million carats annually. In the years 1887 and 1888, consequent on the successful inauguration of underground mining, the output of De Beers Mine rose suddenly to a million carats per annum, raised from only one shaft lifting 2500 loads (of 16 cubic feet) of blue per day of 24 hours. In his report for the year ending 31st March, 1888, the General Manager reported that two other shafts were in course of construction, each capable of hauling twice or three times as much "blue" as the above, and that the quantity of unbroken blue-ground "in sight" above the 800 feet level was over seven million loads. A similar state of things was known to exist in Kimberley Mine, and

though the works in the latter mine had not reached the same stage of development, it was merely a question of time, and each of the two mines would have been able to produce as much as the total output of the whole of the Diamond Fields in previous years. An entirely new problem had therefore to be faced: How to prevent over-production?

It is unnecessary to describe the lengthy negotiations which resulted in the formation of the powerful Corporation now known as the De Beers Consolidated Mines, Limited. Readers may refer for full details to the interesting speech made by the Chairman, Mr. C. J. Rhodes, on the 31st March, 1888, at the special general meeting of the shareholders of the De Beers Mining Company, who by their unanimous votes confirmed and adopted the whole programme for "the consolidation of the Diamond Mining Interests." On that day the De Beers Mining Company practically ceased to exist, the shareholders receiving two fully paid £5 shares in the De Beers Consolidated Mines, Limited, for every fully paid £10 share in the old Company. The Trust Deed of the new Company is similar to that of the old one, with the exception that it contains more varied and extensive powers, and further that it provides for five Life Governors, who are remunerated for their services by a portion of the profits after 30 per cent. per annum has been paid in dividends, in return for which they have to keep in the Company jointly an amount of shares equal to about £750,000 at present market value. They are further bound to offer any diamond interests they may acquire first to the Company at cost, and are not allowed to promote the formation of any diamond company without the consent of their own Company. The first and present Life Governors are the Hon. Cecil John Rhodes, M.L.A., and Messrs. F. S. P. Stow, B. I. Barnato, M.L.A., and Alfred Beit.

Having thus acquired the whole of De Beers Mine from the late De Beers Mining Company, together with their interests in the other three mines, the Consolidated Mines devoted themselves to completing the task of regulating the production, and were so far successful that in their Second Annual Report, for the year ending 31st March, 1890, the Directors were able to announce "that the object with which the Company was originally started has at last been accomplished, and the four diamond-producing mines of De Beers, Kimberley, Dutoitspan, and Bultfontein are now practically under the control of the Company." The first and most important step towards consolidation was to secure the whole of Kimberley Mine, as being the greatest producing factor after De Beers. This was facilitated by the fact that the Kimberley Central Diamond Mining Company had by

successive amalgamations and purchases become possessed of the whole mine. That mine had undergone considerable transformation since the date to which our retrospect brought it some pages back (see page 333). The blue-ground hoisted through the temporary shafts inside the mine had enabled the leading companies to pay off their debts and commence paying substantial dividends, and had placed them in a financial position strong enough to bear the expense of sinking shafts outside the mine. The Central Company in an incredibly short time rushed down an inclined shaft at the west end, and the Standard Company a similar shaft at the north-east corner of the mine, and every facility was at hand for fighting De Beers in the matter of production, when Mr. Rhodes' policy luckily frustrated a ruinous competition that could have benefited nobody. Having first purchased the French Company and resold it to the Central Company (which had meanwhile acquired the Standard and many smaller companies), the De Beers Directors quietly commenced buying up shares in the Central Company till by the end of March, 1889, their interest in the Kimberley Mine was represented by 176,592 £10 shares in the Central Company, and debentures of that Company to the amount of £500,000. They were thus in a position to make advantageous terms for their shareholders for the acquisition of the whole of Kimberley Mine, which was shortly afterwards completed.

In dealing with Dutoitspan and Bultfontein a different principle was adopted, since these mines had, with few exceptions, never yielded any profit to their shareholders, but yet were serious elements as producing factors. For several years they had each produced over half a million carats annually, and though this production was rapidly declining, owing to the reef troubles described above, there was always the danger that these poorer mines might fall into the hands of rival financiers. Amongst the assets taken over from the old De Beers Company were a number of shares in the Griqualand West Company of Dutoitspan and in the Bultfontein Consolidated Company. With both these companies permanent working agreements were entered into by the De Beers Consolidated Mines, by which they obtained practical possession of the companies against payment of an annual rental. During their second financial year they purchased the following properties in the Dutoitspan Mine:—

The Anglo-African Diamond Mining Company.

The Compagnie Générale (including their interest in the Conivieras Mines in the Brazils).

The Sultan Diamond Mining Company.

The United Diamond Mining Company.

And during the same period they bought in the Bultfontein Mine:—

The Bultfontein Mining Company.
The Spes Bona Diamond Mining Company.
The South African Diamond Mining Company.

	£
The total purchase price of these Companies amounted to about	2,564,000
Besides which, payments were made in cash for sundry investments, conversion of Kimberley Central Shares, transfer fees and stamps, cost of liquidation of Kimberley Central Company about	211,210
For British South Africa Company Shares	91,000
For commission and charges raising Second Debentures, &c. about	81,300
For cost of placing 'blue' on the floors.. ..	298,890
Making in all a total of	<u>£3,246,400</u>

To meet this outlay:—

	£
Second Debentures, £1,750,000, were created at issue price about	1,660,000
De Beers Bultfontein obligations (given in purchase of the Bultfontein Mining Company) about	745,400
And 146,464 Shares in the Consolidated Company of Bultfontein Mine held by the De Beers Consolidated Company, which were given in exchange to some of the purchased Companies at the rate of about	156,000
	<u>£2,561,400</u>
Leaving a balance paid out of profits for the year ending 31st March, 1890, of about	685,000
	<u>£3,246,400</u>

The actual cost of the properties controlled by the Consolidated Mines has been something like £14,500,000, but it was decided not to increase the capital of the Company beyond £3,950,000, the successive purchases being paid for by the issue of debentures and the Bultfontein obligations mentioned above.

The balance sheet and profit and loss account of the Company for the year ending 31st March, 1891, showed that the nett profit for the year exceeded a million sterling, out of which two half-yearly dividends were paid of ten per cent. each. The actual cost of winning over two million carats of diamonds was little over a million sterling, practically ten shillings per carat, including all expenses at the mines, all office charges and expenses of management. But out of the gross profits over

£500,000 were written off for depreciation under various heads, and nearly three-quarters of a million sterling expended in interest on debentures and obligations, and in making provision for their redemption. Omitting the amount of £292,000 odd set aside for redemption, the total expenses of the year were under two millions, or roughly, at the rate of eighteen shillings per carat. The diamonds found, on the other hand, were sold at the average rate of nearly thirty shillings per carat, leaving a nett profit of nearly twelve shillings per carat.

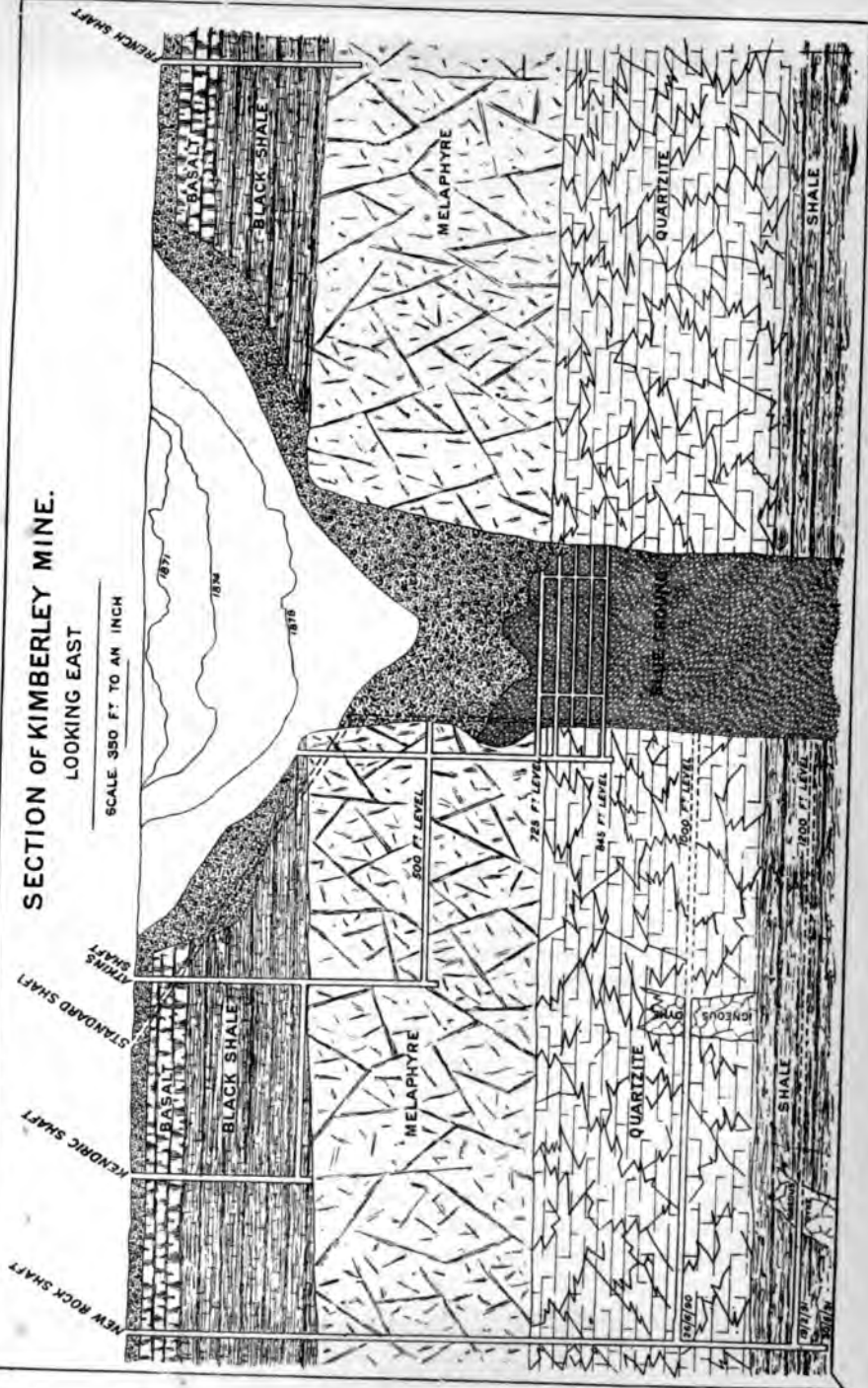
At the annual meeting of shareholders at Kimberley, in November, 1892, owing to a change of date of the financial year to 30th June, the balance sheet and profit and loss account submitted, covered a period of fifteen instead of twelve months. These showed that from March 31st, 1891 to June 30th, 1892, 3,338,553 loads of blue ground had been hoisted out of the mines, and 3,239,134 loads of blue were washed (in addition to 454,280 loads from Dutoitspan and Bultfontein), the whole of which yielded 3,035,481 carats of diamonds, valued at £3,931,542 11s. 1d., which, with dividends on investments, &c., brought up the revenue to £3,994,030. The total expenditure for the same period, including working expenses, payment of interest on the Company's debentures and obligations, and making provision for their redemption, amounted to £2,794,234, leaving a balance of profit of £1,199,796. The dividends paid out were on 30th June, 1891, 10 per cent.; on 31st December, 1891, 12½ per cent.; and on 30th June, 1892, 12½ per cent.—all on a capital of £3,948,955,—besides a bonus dividend of £157,958 in British South Africa Company's shares, distributed on 31st December, 1891.

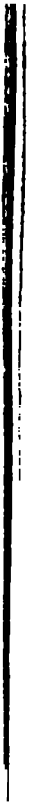
To describe with any degree of fulness the gigantic operations conducted by this Company, with its elaborate machinery and mining appliances and its army of workpeople, would require a much larger space than the prescribed limits of this article will permit. A brief sketch only can be given of the modern methods employed for winning the diamonds, and those desiring further details must consult the Technical Report issued by Mr. Gardner F. Williams in 1890, and the Reports of the Inspectors of Mines for the last three years, and also the Annual Reports of the De Beers Directors.

The section of Kimberley Mine reproduced herewith will convey an idea of the general formation of the diamond-bearing pipe, with its encasing rocks, and of the main shafts and workings which have been constructed therein. The New Rock Shaft on the north side of the mine was started in March, 1889, and is connected with two main tunnels, one at 1000 feet, the other at

SECTION OF KIMBERLEY MINE. LOOKING EAST

SCALE 350 FT TO AN INCH





1200 feet from the surface, the distance from the shaft to the mine being about 1134 feet. The shaft is 6 feet wide and 20 feet 6 inches long, divided into four compartments, one for pumping, two for hoisting the blue, and one for a double-decked cage to carry the white miners to and from their work. The hoisting is performed by a pair of vertical tandem compound condensing winding engines, with Corliss valve gear and reels for flat ropes, capable of hoisting skips holding six loads of blue ground from a depth of 1000 feet in forty-five seconds. Arriving at the surface, the skips are tipped automatically into ore-bins, from which the blue ground is filled into steel side-tipping trucks of twenty cubic feet capacity, and conveyed to the depositing floors by an endless chain haulage driven by an independent steam-engine.

"For a time the blue ground remains on the floors without much manipulation. The heat of the sun and moisture soon have a wonderful effect upon it. Large pieces, which were as hard as ordinary sandstone when taken from the mine, soon commence to crumble. At this stage of the work the winning of the diamonds assumes more the nature of farming than mining. The ground is continually harrowed to assist pulverization, by exposing the larger pieces to the action of the sun. Spans of mules" were formerly "used for drawing the harrow to and fro, but steam traction engines with gear for drawing the harrows," on Fowler's well-known steam-ploughing system, are now employed at both Kimberley and De Beers. "The length of time necessary for the ground to be exposed before it becomes sufficiently pulverized for washing depends on the season of the year and the amount of rain. The blue ground of the four mines differs as to the length of time necessary for pulverization. The blue from Kimberley Mine becomes quite well pulverized in three months during the summer" (the rainy season), "whilst that from De Beers requires double that time. The longer the ground remains exposed, the better it is for washing." * Some of the De Beers ground is so hard that it has to be broken in a Marsden crusher.

The washing gears for the treatment of the pulverized "blue" are erected on high mounds of tailings accumulated from former workings, and are very elaborate sets of machinery, the result of fifteen or twenty years of experimenting to reduce the loss of diamonds to a minimum. In the very early days of the Fields,

* The passages in inverted commas are taken by permission from Mr. Gardner F. Williams' exhaustive Technical Report, attached to the General Manager's Report for 1890.

when water was scarce and costly, the diamonds were won by "dry-sorting" the pulverized ground, and the resulting "débris," scattered over a large area of the townships, has since been nearly all washed with more or less of profit to the workers. The modern washing-machine consists of four essential parts, a hoist for lifting the dry pulverized ground from the floors, a puddling cylinder, in which it is mixed with water, an annular pan with revolving arms and teeth, and an elevator for getting rid of the tailings.

"The diamond occurs in all shades of colour, from deep yellow to pure white, from deep brown to light brown, and in a great variety of colours—green, blue, pink, brown, yellow, orange, pure white, and opaque. It is the hardest of known substances, and has a specific gravity of 3.83. The stones vary in size from that of a pin's head to the size of the cut given below. This diamond weighed $428\frac{1}{2}$ carats in the rough (a carat weighs 3.17 troy grains), and is the largest stone ever found in the four mines. It measured $1\frac{1}{8}$ inches through the longest axis, and $1\frac{1}{2}$ inches square. The following cut represents the size and shape of the stone as found:—



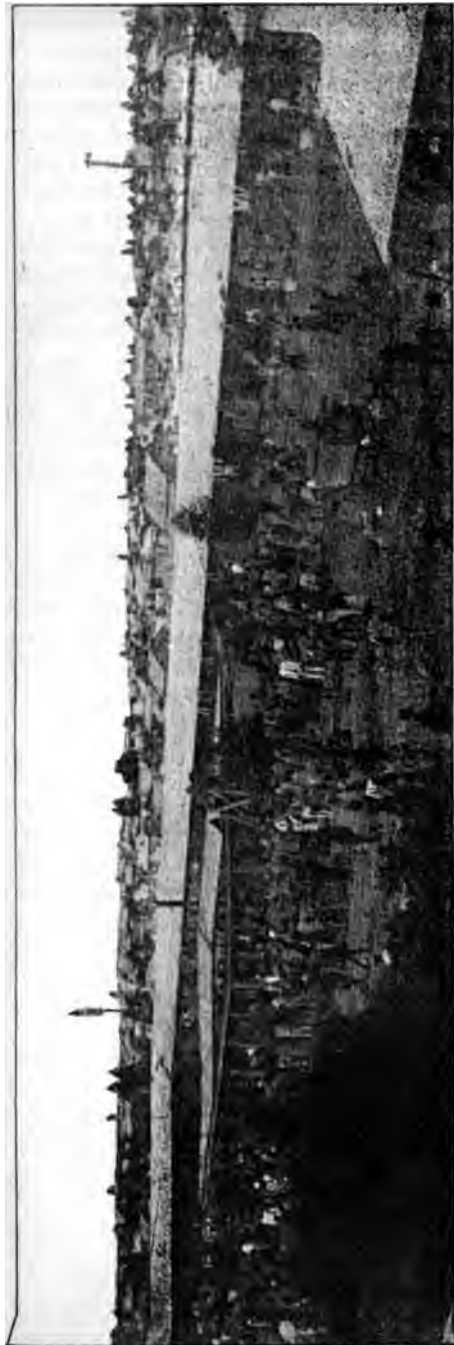
$428\frac{1}{2}$ Carats.

"It was found in the De Beers Mine by a native, whose 'brother' gave information which led to its recovery, while being taken from the mine. It was cut and exhibited at the Paris Exposition, 1889. Its weight after cutting was $228\frac{1}{2}$ carats, having lost 200 carats in the process of cutting.

"After assorting at the pulsator, the diamonds are sent daily to the general office under an armed escort, and delivered to the valuers of the Diamond Department. The first operation is to clean the diamonds of any extraneous matter by boiling them in a mixture of nitrate and sulphuric acids. When cleaned, they are carefully assorted with reference to size, colour, and purity. Parcels are then made up, and when valued are sold to local buyers, who represent the leading diamond merchants of Europe. The size of a parcel varies from a few thousands to tens of thousands of carats. In one instance, two or three years ago, nearly a quarter of a million of carats were sold in one lot to one buyer.

"In order to prevent illicit traffic, the quantities of diamonds found are reported to the Detective Department, both by the producers and by the exporters. All diamonds, except those which pass through illicit channels, are sent to England by registered post. The weekly shipments average from 40,000 to 50,000 carats."

The "compounds" for the native labourers employed in the mines are peculiar features of the Fields. Both at Kimberley and De Beers these compounds, consisting of rows of buildings of corrugated iron, forming four sides of a square enclosed with a high fence, cover several acres of ground. Within these areas, the natives are confined during their term of service which is generally for three months, at the end of which time many of them re-engage for further periods. Wood and water are furnished free; a large swimming bath is provided; and the sick are taken care of in a hospital where medical attendance, nurses, and food are supplied by the Company. Wages are paid to the men wholly in money, and within the compounds there are several stores furnished with all the necessaries of life, where they can purchase food, clothing and whatever they require. No alcoholic liquors in any form are allowed to them, and during the period of service they are strictly guarded against having any communication with the world outside the compound. The natives are thus provided with wholesome food and healthy quarters, protected from indulging in poisonous liquors, and by a system of close personal surveillance and systematic searching whenever they come up from the mine shafts to the surface, their opportunities or chances of stealing or concealing diamonds are materially reduced. Among these natives are to be found types of all the tribes of South Africa—Kaffirs, Basutos, Zulus, Bechuanas, Matabele, Fingoes, Shangains, Makalakas, &c., and in the open square of the compounds, the visitor who watches the groups of ebony figures draped in blankets, chatting,



DE BEERS COMPOUND, KIMBERLEY.

laughing, gambling, feeding, or sleeping in every imaginable pose, may attain a more realistic picture of native life than anywhere in the interior of the Dark Continent.

The European employés of the Company are free to live where and how they please; but a model village for the accommodation of a number of them, has lately been designed and erected at Kenilworth, near De Beers. Four or five years ago, Kenilworth was nothing but an extensive patch of barren land. Now it is covered with trees, thirty to forty feet high. Roads and streets have been laid out upon it, and comfortable red-brick cottages built, each with its shrub-clad porch, verandah and flower garden. There were fifty houses occupied towards the end of 1892, and more were in course of erection. Portions of these were for married men and families, others were quarters for single men. The rent of a four-roomed house, with kitchen, offices, and water laid on is from £4 10s. to

£5 monthly. Single men have their rooms from £1 a month and 25s. per week for board. At the entrance of the village are a church, and a club house, the latter containing, besides a large common dining-room, an excellent reading room, where books, magazines, and newspapers are kept, and also a billiard room with two good tables, the gift of some of the life-governors of the Company. Adjoining the village an orchard has been planted and about thirty acres of ground covered with 4,000 fruit trees—peach, apricot, apples, pears, plums, &c.—already bearing fruit although only in their second season. This orchard is intended to furnish the villagers with fresh fruit at reasonable prices, and any surplus will supply the compounds.

A few words must be added about the mines and diggings outside the control of the De Beers Consolidated Mines. This Company owns the whole of Kimberley and De Beers Mines, and the greater portion of Dutoitspan and Bultfontein, but is at present doing no work in either of the latter mines. Mining operations had to be suspended owing to reef falls, and the results of the last year's washing were not very satisfactory. The yield from Dutoitspan Mine was $14\frac{1}{100}$ carats per 100 loads, and from Bultfontein Mine $16\frac{6}{100}$ carats, being the average results obtained from over half a million loads washed from each mine.

In Dutoitspan Mine there are only two companies outside De Beers, viz., the *New Gordon Diamond Company, Limited*, and the *British United Diamond Mining Company, Limited*. The former Company has acquired a large number of new claims on the eastern extension of the mine, in addition to the previous holding on the north reef, and has sunk a large shaft outside the mine, with which it is connected by a tunnel at a depth of 260 feet. Some interesting light has recently been shed on the geological formation of Dutoitspan Mine. At a depth of about 300 feet below the red soil, the Gordon Company has struck quartzite in a drive and pass from its No. 2 shaft, which would appear to indicate that the melaphyre is absent in this mine, a fact (if verified) of considerable importance to the future profitable working of the mine. The Gordon was one of the earliest companies formed in this mine some twelve years ago, and was known to possess some of the richest claims. The Company was reconstructed under its present title in March, 1891, with a capital of £410,250, and now owns 435 claims, about half of which are on the "extension," and therefore still in yellow ground. It is well equipped with machinery of modern type, including a new design of washing gear, in which it is intended to treat the maiden "blue" as it comes from the mine without previous depositing. The

operations of the Company have been much hampered by a great accumulation of water in the mine, estimated at some 60,000,000 gallons, consequent on the stoppage of work in the De Beers claims, and the question as to who shall remove this water is still under consideration by the law courts. The head offices of the Company are in London.

The *British United Company* owns some 70 odd claims on the south reef which are not being worked at present owing to reef troubles. The stoppage of Dutoitspan Mine has caused considerable loss and distress to the tradespeople and population of Beaconsfield, which was a flourishing township in the days when its two mines were in full operation, but it could hardly be expected that De Beers should work these poorer mines at little or no profit, as long as it can win all the diamonds it requires from the two richer mines.

In Bultfontein Mine, apart from the claims of King, Neumann, and Wernher, there is only one independent company left, the *North Eastern Bultfontein, Limited*. This company has done a considerable amount of development, and has erected powerful machinery to work a large block of new claims taken out on the northern extension of the mine. Both these claims, and those of the Dutoitspan extension, are maiden ground, and do not appear on the old plans of the mines.

The North Eastern Company has sunk three shafts through the maiden blue ground to depths of over 500 and 600 feet. Two of these shafts are connected at the latter level, at which some 3000 feet of tunnels and passes have been opened out. A large block of claims is also being worked in the open, from which at date of writing the chief supply of blue is being drawn. The drives from the North Eastern Company's shafts at the 600 feet level have struck the quartzite, but the depth of the shales is not known, nor has it been ascertained whether the melaphyre exists in this mine. The North Eastern property consists of 671 claims. The size of a claim in both Dutoitspan and Bultfontein Mines is 30 feet by 30 feet, for which a monthly rental of thirty shillings per claim is paid to the landlords, the London and South African Exploration Company, Limited. Each claim carries with it one acre of depositing floor, so that the floors of the two mines cover five or six square miles of country. The North Eastern Company derive their water supply for washing purposes from the "Pan," a natural basin which receives the surface drainage from the surrounding country, and which of late years has grown into a lake of imposing dimensions. A similar lake of smaller size, known as Blanckenberg's Vley, exists about a mile to the north

of Dutoitspan Mine, from which the New Gordon Company has the right of pumping.

The *Saint Augustine's Mine*, so called from the church of that name which stands on the property, was "rushed" some 12 years ago in the days of the first "boom," and is now owned by a London Company, which has erected powerful machinery and done a considerable amount of development down to a depth of 800 feet from the surface, all the mining being underground, but very little is known publicly as to the results obtained.

Otto's Kopje is another mine that was rushed in the "boom" of 1880, and after standing idle for many years is now the property of the Otto's Kopje Diamond Mines, Limited, a company recently reconstructed in London with a capital of £500,000, which holds some 500 acres under lease from the Cape Government, including two mines lying a couple of miles to the west of Kimberley. No. 1 Mine has been prospected by means of a shaft sunk to a depth of 1200 feet into the "blue," but the new management is devoting its energy to the exploitation of No. 2 Mine, which it is proposed to work on a large scale as an open mine in the yellow ground, for which purpose extensive machinery is shortly to be erected.

There are several other mines in Griqualand West, most of which were rushed twelve years ago and soon after abandoned, but some of them are now being reopened in the hope that they may prove payable under the cheaper conditions of working which obtain to-day. But more important than any of the outside mines mentioned above is the *Premier Mine* (Wesselton), which was only discovered in the latter part of 1890, though it lies within a mile eastward of Dutoitspan Mine, on the farm Benauwdheidsfontein, part of the Wessels Estate, which has been known for years to contain diamonds, and has been prospected right and left any time these last twenty years. The mine had been overlooked owing to the absence of the ordinary surface indications. It lies in a slight depression, whilst most of the other mines were originally "kopjes," or slight hillocks, and the diamondiferous soil is covered by a thick deposit of 8 feet or 12 feet of tufaceous limestone. It had actually been used as a depositing site for the dry rubbish of the township of Beaconsfield. The coach road from Kimberley to Bloemfontein passes over the estate, which comprises fifteen farms of a total of 52,000 acres, and is cut in two by the boundary line of Griqualand West and the Orange Free State, only 6000 acres lying within Colonial territory; but the whole estate is held under a Free State title. In spite of this the Premier Mine was "rushed" in the early part of 1891, but the rushers were subsequently turned off as

trespassers, and the mine reverted to Mr. H. A. Ward, who had acquired the prospecting rights on the whole estate. He has since entered into an arrangement with the De Beers Consolidated Mines, Limited, whereby the latter company have purchased the entire Wessels Estate of fifteen farms, including the Premier Mine, for the sum of £303,000. Mr. Ward's part of the bargain gives him the right to mine and wash for his own benefit 5,000,000 loads of yellow ground in the five years 1892 to 1896, out of which he has to pay back to De Beers half the above purchase price and interest on the whole at 9 per cent. per annum. He is also bound not to sell more than 20,000 carats of diamonds per month.

There are 1125 claims in the Premier Mine, which after deducting the area covered by "floating reef," will yield the prescribed quantity of 5,000,000 loads by taking out the yellow ground to a depth of about 70 feet. This will still leave a large amount of "yellow" to be treated by De Beers, besides all the blue ground, which Mr. Ward is not allowed to touch. Owing to the great facilities of working top stuff, which is hauled from the mine up inclined tramways, and tipped direct into the washing machines, the yellow ground can be treated at a cost not exceeding 1s. 6d. per load, which on a low estimate of its value will leave a nett profit of 2s. 6d. per load, so that Mr. Ward is likely to make about half a million sterling by his bargain. On the other hand, the property acquired by De Beers is remarkably cheap, and a magnificent addition to the assets of the Company. At present there is ample water in the mine for washing purposes, but the greater part of the "Pan" falls within the property, and is a most valuable water-right.

As already mentioned, there are several diamond mines within the Orange Free State, most of which have been worked spasmodically for many years past. The only mine of real importance is *Jagersfontein*, which was discovered twenty years ago, and after passing through numerous ups and downs is now the sole property of the New Jagersfontein Mining and Exploration Company, Limited. The capital of this Company is now £1,000,000, and in addition to holding the entire mine the Company owns the total number of shares in the Jagersfontein Mining and Estate Company, Limited, which pays 6 to 8 per cent. yearly on its capital of £100,000, being the proprietor of the farm and drawing licences from all the stands in the township, as well as recovering one half of the claim licences collected by the Government. Amongst the other assets of the Company are 10,000 £5 shares in the De Beers Consolidated Mines, and a remarkable brilliant of 55 carats found originally in the claims of the Jagers-

fontein United Company and taken over on amalgamation. It was previously known as the "Pam" brilliant, but is now called the "Jagersfontein." It weighed in the rough about 112 carats, and is valued at £25,000, being at present on view and for sale at Messrs. R. & S. Garrard & Co., the Haymarket. Some short time since the Queen telegraphed for the brilliant to be sent to Osborne with the intention of purchase, but the untimely death of the Duke of Clarence put a stop to the transaction. During the financial year ending 31st March, 1892, the New Jagersfontein Company washed 1,156,095 loads of ground, producing 110,171 carats of diamonds, realised and valued at £195,271 4s. 9d., being an average yield of over 9½ carats per 100 loads of blue, and an average value of over 35s. 6d. per carat. The average price realised for Kimberley and De Beers diamonds during the fifteen months ending 30th June, 1892, was 25s. 6d. per carat, so that it will be seen the Jagersfontein diamonds are some 30 or 40 per cent. better in quality than those of De Beers. The yield of diamonds from De Beers blue is, however, about ten-fold that of Jagersfontein. Still the latter mine is being worked at a good profit, and with increasing depth the ground is said to increase in value, whilst the working expenses have been reduced to about 2s. 3d. per load, which is a high testimony to the ability and efficiency of the management. The mine has been entirely worked on the open quarry system.

The only other Free State mine deserving mention is *Koffyfontein*, situated on the Riet River, about fifty miles south-east of Kimberley, in a direct line between there and Fauresmith. The Koffyfontein Farm is owned by the London and Orange Free State Exploration Company, who bought it from Mr. Rorich in 1880 for £80,000. A number of companies were formed at that time to work the mine, but all came to grief. In November, 1889, after having remained unworked for several years, the claims were sold by public auction in Kimberley, when 1187 claims realised £70,772, 300 claims being kept in reserve by the proprietors of the farm. The mine was once more proclaimed a public digging, and several new companies set to work. The finds of diamonds registered from December, 1887, to April, 1891, amounted to 9912 carats, valued at £14,640, or an average of nearly 30s. per carat. Elaborate waterworks have been constructed on the Riet River, for which hitherto there has not been much use, as the mine was again abandoned soon after their completion. Last year (1892) the Free State legislature passed a law declaring the working of claims in Koffyfontein compulsory, under penalty of forfeiture, which has partly induced a return of activity at this mine, where several parties of diggers

are once more at work. Besides this, a block of 1000 claims has been taken up by an English syndicate, who intend to thoroughly test the mine on a much larger scale than has ever been attempted before.

The town of Barkly West, pleasantly situated on the right bank of the Vaal River, twenty miles north-west of Kimberley, is the centre of the River Diggings, which extend up and down the river on both banks, a distance of some seventy miles from above Hebron to its junction with the Harts. These diggings are very unlike the Kimberley Mines, being all in alluvial soil, a heavy deposit of ferruginous gravel mixed with red sand, lime, and boulders, that has been washed into the crevices of the rocks by the action of the river, which has cut its way through a hard volcanic rock, probably diabase, which stretches for miles on either bank and extends from near Potchefstroom almost to the junction of the Vaal and Orange Rivers. There is little doubt that this rock is identical with the "hard rock," or amygdaloidal melaphyre, of Kimberley Mine. The Kimberley shales thin out and vanish as the Vaal River is approached, and the great sheet of melaphyre appears there on the surface. Whether the diamonds which the heavy deposit contains have been formed *in situ*, or whether they were brought from a distance, is still a vexed question, but the balance of evidence is in favour of the former hypothesis. Most of the diggings are very shallow, but in some cases they are nearly a hundred feet deep before the bed rock is reached. Several companies have been formed at various times for working the deep alluvial, but they have not been very successful, and the fact appears to be that the River Diggings are poor men's diggings, which yield a fair return to hard-working individuals, but which do not justify the outlay of much capital. They are still being worked very much as they were twenty years ago, and the original digger is still to be found there with all his primitive appliances, living his free arduous life, often with but scanty fare, and occasionally diversified by a trip to Kimberley. The result of amalgamation has been to increase the activity at the River Diggings, where there are now probably nearly a thousand white men at work, in addition to their native labourers. In 1889 the Government revenue from claim licences, &c., amounted to a little over £6000, being an increase of £1000 on the revenue received in 1888, whilst in 1890 it rose to £9500. The approximate weight of diamonds found at all the River Diggings has remained pretty constant for several years past, having seldom much exceeded 30,000 carats per annum, that is, about one per cent. of the production of the Kimberley Mines, but the quality of the river stones is superior even to those of Jagersfontein,



SORTING GRAVEL AT WALDEK'S PLANT, VAAL RIVER.

[To face page 354.]



being generally about twice the value of the average price realised for Kimberley stuff. During the year 1890 the approximate weight and value of diamonds imported into Kimberley from the Barkly Division were 28,122 $\frac{3}{4}$ carats, valued at £79,231 11s. 3d. (data supplied by the Detective Department), equal to 56s. per carat. The value of the production of the Kimberley Mines during the same period was only 31s. 1 $\frac{1}{2}$ d. per carat.

There are a number of Dry Diggings in the Barkly District, similar in formation to the Kimberley Mines, but none of them has proved payable.

It is only since the establishment of the Board for the Protection of Mining Interests in 1882 that accurate statistics have been compiled of the value of the production from each mine, and also of the imports of diamonds into and exports from Kimberley, but from the Postal and Customs Returns an approximate estimate may be formed of the production prior to 1882. Comparing all available sources of information, it may be confidently stated that we have exported to date (1893) over 50 million carats of diamonds, of a total value of seventy millions sterling. As about five million carats go to a ton, the weight of diamonds exported has amounted to over ten tons. If piled into a heap, they would form a pyramid 6 feet high, with a base 9 feet \times 9 feet; or they would fill a box 5 feet \times 5 feet \times 6 feet.

The above estimate of the total value of diamonds exported to date makes a small allowance for the diamonds known to have been exported through private and illicit channels. The Official Return of diamonds exported from the Cape Colony, compiled by the Collector of Customs, gives the total value, for the twenty years from 1872 to 1891 inclusive, at £58,110,923. To this must be added at least a couple of millions for diamonds exported prior to 1872, and a further four millions for the exports of 1892, making a total of sixty-four millions sterling from the discovery of the Fields, so that the above estimate of *seventy millions* assumes only ten per cent. to have been illicitly exported, which is probably far below the actual figure.

For the past five years the value of diamonds exported has remained at between four and four-and-a-quarter millions per annum, and this appears to be the maximum value the market can take without unduly affecting the price.

It has been shown in the previous pages how the control of the diamond industry has gradually passed into the hands of a powerful Corporation, which for the first time in the history of the Fields has enabled shareholders to depend on reasonable and regular dividends.

Meanwhile there is no doubt the trade and population of Kimberley and Beaconsfield have declined from what they were some years ago; but it must be borne in mind that many causes have been at work, in addition to the amalgamation of the mines, which largely account for this shrinkage. The northern extension of the railway is one cause, the rise of Johannesburg and the transfer to that place of the share market from Kimberley is another.

The permanence of the leading industry of the Colony, however, is now assured, and, with a yearly expenditure of about a million sterling at the mines, there will always be steady employment for a large number of men at good wages, and a considerable amount of trade.

CHAPTER XVI.

THE COLONY OF NATAL.

THE territory forming the British Colony of Natal, on the east coast of South Africa, was first discovered by Vasco de Gama during the celebrated voyage in which he found his way round the Cape to India. From the coincidence of its having been sighted on Christmas Day, 1497, he called it "Terra Natalis," which name has grown into the one now in use. About two centuries later, the Dutch, who were established at the Cape, gained some knowledge of the place from mariners who had been shipwrecked there; and, by a formal purchase from a native chief, they added the port of Natal to their South African possessions, but no steps were taken to establish any permanent settlement in the country. It was left unnoticed until nearly the end of the first quarter of the present century, when some of the English then settled on the Cape frontier were attracted to it by the love of adventure. They engaged in elephant-hunting and trading for ivory, and a few of them had friendly intercourse with the Zulu chief, Chaka. Among the early pioneers were Mr. Henry Fynn, Lieutenants Farewell and King, Messrs. Isaacs, Cane, Ogle, and others, who secured from Chaka a concession of the coast north and south of the port, with all the country extending a hundred miles inland. They urged upon the Governor of the Cape, Lord C. Somerset, the advantage of establishing a British colony there; but the latter declined to authorise the enterprise.

The Europeans, however, held their own amidst the savage population around them, although the lives of some of their number, including that of Lieutenant Farewell, were sacrificed by native treachery. In 1835, Captain Allen Gardner visited Chaka's successor, the chief Dingaan, on a missionary tour to the Zulus, and concluded a treaty with him on behalf of the English settlers. The residents at the port then laid out the town of Durban, and petitioned the Crown that their settlement might be recognised as the colony of "Victoria." To their petition, the Government replied that, with every disposition to appreciate the benefits of an extension of commerce, the finances would not allow of any additional expense for a new settlement. After this, the emigration of Dutch farmers from the Cape Colony set in, with the stirring incidents connected with the "Boer trek," as elsewhere related.

In 1843, after the formal submission of the Boers and the assumption of sovereignty by Great Britain, the Colony of Natal was, for a year or two, placed under the Cape Government. But this arrangement did not answer; the officials at the Cape were ignorant of the wants of the country, and could not satisfactorily legislate for it. In 1848, letters patent were issued constituting the territory a separate Government, under a Lieutenant-Governor and Executive Council, Mr. Martin West being appointed as head of the Government.

The European population was then almost reduced to the original elements. There was little trade, and very little revenue. About 100,000 natives were spread throughout the country, and their numbers were being continually augmented by refugees from Zululand. A Commission was appointed to consider plans for bringing them under European management and control. The course recommended by the Commission was, that the natives should be placed on reserved lands, named "locations," in different parts of the colony. But an essential feature of their proposal was, to establish at once among these communities, qualified European functionaries to control and guide them through the serious ordeal incidental to their progress from barbarism to civilisation. Upon this depended the success of the scheme. The carrying out of it, however, required money, and no money was to be had. The natives were thus left to themselves, with none of the restraints of civilisation, beyond what the teaching of Christian missionaries inclined them to adopt.

The letters patent of 1848 directed that the organisation existing among them should not be disturbed,—that there was to be neither interference with nor abrogation of any law, custom, or usage prevailing amongst them previous to the assertion of authority over the district, except so far as the same might be repugnant to the general principles of humanity recognised throughout the whole world. In pursuance of this instruction, in 1849 an ordinance was passed, conferring upon the Lieutenant-Governor all the authority of a Supreme Chief over the natives, and empowering him to administer native law among them, through officers he saw fit to appoint, such as the Secretary for Native Affairs, the magistrates, and petty chiefs. The old tribal polity was thus maintained within the colony. The hereditary chiefs were looked to and held responsible for the good order and government of the people, who were left to grow up as a pagan community.

The necessity for strengthening the European population became apparent; and efforts were made to direct attention to the suitability of the country as a field for British emigration. A gentleman, named Byrne, who had visited it in 1843-44, organised

a scheme for the introduction of settlers, engaging to furnish a steerage passage, with twenty acres of land after arrival, for the sum of £10 per statute adult. He travelled about England, delivering lectures on emigration, and especially on the advantages Natal presented to men of small capital. The result was that, between 1848 and 1850, thirty-five vessels arrived, bringing 3,792 emigrants. Their expectations, in many instances, were disappointed. The twenty-acre settlements were not in general suited or sufficient for cultivation, and those who could earn a livelihood otherwise than by agriculture, abandoned them and took to trades and other occupations. After the first vicissitudes had passed, many successfully established themselves in the land of their adoption, becoming in course of time thriving and wealthy colonists. Crude and ill-managed as this emigration scheme was, it contributed to set in motion towards this part of South Africa some portion of the stream of European life which was flowing to other lands. The capabilities of Natal were partially developed, and it was proved that sugar, coffee, arrowroot, and other inter-tropical products could be profitably cultivated over a considerable extent of its coast lands.

On the death of the first Lieut.-Governor, Mr. West, in 1849, the administration for a short time devolved upon Lieut.-Col. Boyes, but in 1850 Sir B. C. C. Pine was appointed to the office. The colony was then divided into six counties, each having local councils for the management of district affairs; and in the two chief towns, Pietermaritzburg and Durban, municipal corporations were established.

In 1855, Sir G. Grey, as High Commissioner, visited the settlement. He was directed by the Secretary of State to inquire into and report upon two subjects,—one, the removal of a portion of the native population; the other, the introduction of representative government. Mr. T. Shepstone, the Secretary for Native Affairs, had submitted a plan to relieve Natal of its native difficulty, by drawing off half of its increasing Zulu population into the unoccupied territory south-west of the colony, near the St. John's River, where he proposed to establish rule over them, and as their chief to govern them according to their own laws and customs, so modified from time to time, as gradually to ameliorate their condition. The scheme did not find favour with Sir George Grey, who considered it most undesirable, under any circumstances, to collect ordinary barbarians in such large masses, and he advised that neither directly nor indirectly, should any encouragement be given to the measure; and his policy in so doing was approved of by the Secretary of State.

The proposition for granting representative institutions to

Natal originated with Sir B. C. C. Pine, who urged, that with a singularly popular constitution at the Cape, and with free republics on its borders, it was impossible to delay the grant of a representative legislature, and the sooner it was conceded, the more moderate and safe might its character be made. Sir George Grey, after acquainting himself with the wishes of the inhabitants, whom he found peculiarly distinguished by "intelligence and prudence," recommended that a Legislative Council should be given to them. The European population at this time was estimated at 8,500.

In 1856, Mr. John Scott was appointed Lieutenant-Governor, in succession to Sir B. Pine, and to him was assigned the duty of inaugurating the new constitution. His term of office extended until 1864. During these years the colony enjoyed a considerable degree of prosperity, and made marked progress. Immigration was encouraged. Private enterprise engaged in the new industries of sugar, coffee, and cotton-growing; and as the irregular and unskilled native labour supply could not be relied upon for the success of these undertakings, Coolies were introduced from India. The prospects of Natal were considered good; and through the formation of various joint-stock associations, foreign capital and credit were introduced and liberally made use of. In 1866, however, the face of affairs changed. Many of these enterprises failed to realise the expectations with which they had been set on foot, and were discontinued or carried on at a loss. A commercial crisis had to be passed through, and trade and the public revenue showed a marked decline.

Colonel Maclean succeeded Mr. Scott in the government, but he soon succumbed to ill-health, and his place was temporarily filled by Colonel Bisset, as administrator, until in 1867, Mr. Keate was appointed Lieutenant-Governor. Soon afterwards, the Government and the Legislature came into collision upon the equalisation of the revenue and expenditure. The representative members in Natal, as in the Cape Colony, complained that they had no control over the administration. The aspirations of many of them were for responsible government. But Earl Kimberley informed them, that in the case of a colony like Natal, where a handful of white settlers were surrounded by a warlike population, the objections to that form of government were of a serious character; and as the Crown was responsible for the protection of the colony and the government of the native population, it must have secured to it the means for carrying on the business of the administration.

In 1873 the office of Lieutenant-Governor was again filled by Sir Benjamin Pine, who had administered the affairs of the settle-

ment eighteen years previously, and who was heartily welcomed by the old colonists. Trouble then occurred with the Amahlubi tribe, under the chief Langelibalele, whose people had obtained guns at the Diamond Fields, and refused to bring them into the magistrate's office for registration, as required by law. An expedition was despatched against them, whereupon, they sought to escape into Basutoland by the Bushman Pass, and, in attempting to stop their progress, three of the Natal Carbineers and two natives were shot. The chief and his sons were subsequently captured and tried for rebellion against the Supreme Chief, and sentenced to banishment and imprisonment for various periods, and the tribe was broken up. The Bishop of Natal (the late Dr. Colenso) espoused the cause of the chief and his tribe, and the attention of the home authorities was directed to the system of native administration. Sir B. Pine retired, and Lord Wolseley was sent out as temporary Governor, accompanied by Colonel Colley, Major Brackenbury, Major Butler, and Lord Gifford. The General and his brilliant staff inquired into the affairs of the colony, and the relations existing between the Europeans and natives, with the result that they deprecated in strong terms the sensational stories which found credence in England respecting the ill-treatment of the latter. The natives of Natal they described as "well off in every sense, and as a people far in advance of those not living under British rule." General Wolseley's special mission, however, was to strengthen the power of the Executive in the Legislature, and this was secured by an increase of the nominee members. In August, 1875, he was succeeded by Sir Henry Bulwer, who, in the following year, at the instance of Lord Carnarvon, the Secretary of State, introduced modifications and changes in native administration, with a view to bring the native races more closely under the influence of civilised law and life, and in addition, he initiated the construction of railway works from the port to the uplands, which inaugurated a new era in the history of the colony.

External events, however, seriously affected its progress for some years afterwards. The annexation of the Transvaal, the Zulu War, and the Transvaal War—elsewhere referred to—all exercised a disturbing and baneful influence, although for a time the war expenditure caused an inflation of local business, and augmented the public revenue.

From the position of the port of Natal, as the nearest gateway from the south-east coast to various parts of the interior, along a healthy line of communication, its chief towns have long been emporiums for what has been termed the "Overberg," or inland trade. Portions of the South African Republic and the Orange

Free State, as well as the Native Territories to its right and left along the coast, opened up channels of commerce which contributed to swell the imports and exports, and furnished employment in transport, by rail or wagon, to the enrichment of the colony. This has been an important factor in the growth and development of Natal during the fifty years of its existence. The remarkable progress it has made in this period will be best illustrated by the following statement of its revenue and trade:—

	Revenue.	Imports.	Exports.
	£	£	£
1850	32,112	111,015	32,112
1860	77,480	354,987	77,480
1870	126,293	429,527	126,293
1880	582,715	2,336,584	582,715
1881	600,177	1,331,115	960,029
1888	990,614	2,890,468	1,417,871
1890	1,507,788	5,164,772	1,582,228
1892	1,392,455	3,690,734	1,354,885

The present amount of the public debt of the Colony (the greater part of which has been spent upon railways and harbour), is £7,170,354 0s. 4d., bearing interest at the rate of about 4 per cent. The principal sources of revenue are customs, railways, hut tax, land sales, land revenue, mail and telegraph service, excise duties and stamp duties. The approximate valuation of properties for taxation purposes is £11,395,000.

The area of Natal is 20,460 square miles. Its population at the census of 1891 numbered 555,576 persons. Of these the Europeans or whites were 42,759; the Indians, 43,070, of whom 30,000 were free and about 10,000 indentured, and the aboriginal tribes were returned as 469,747 souls. Out of a total European male population of 24,795, there were 13,037 between the ages of 18 and 55, or more than half of the number available for military service. Those engaged in agricultural and pastoral pursuits were returned as 3,325, while the industrial class, including artisans and mechanics, counted 6,628. The birth-places of this population showed 11,434 from England and Wales; 3,226 from Scotland; 1,000 from Ireland; 2,269 from European countries, the residue being chiefly Natal and South African born.

The Government, at present,* is administered by Sir Charles

* While these pages were in the press, Sir Charles Mitchell was appointed Governor and Commander-in-Chief of the Straits Settlements, to be succeeded as Governor of Natal by Sir W. F. Hely-Hutchinson, K.C.M.G., Governor of the Windward Islands.

Bullen Mitchell, K.C.M.G., who is Governor, Commander-in-Chief, Vice-Admiral, and Supreme Chief over the native population. He has been assisted by an Executive Council, together with a Legislative Council, composed of thirty-one members, twenty-four of whom were elected, five officials, and two nominated by the Governor. But a change in the constitution of the Colony is now taking place. The electors, by a slight majority, have declared in favour of an advanced form of government, which will harmonise their position with that of their fellow-colonists at the Cape and in other parts of the Empire, and the Imperial Government has signified its consent. Measures for the establishment of responsible government are, therefore, in course of progress.



SIR CHARLES BULLEN MITCHELL,
K.C.M.G., GOVERNOR OF NATAL
AND ZULULAND.

The Legislature is, in the future, to consist of two Chambers—a Legislative Council composed of eleven members, nominated by the Governor-in-Council and a Legislative Assembly of thirty-seven members, chosen by the electors. The qualification of members for the Council is, being of the age of thirty years, resident in the Colony for ten years, and registered proprietor of unencumbered property of the value of £500. They hold their seats for ten years, but at the end of five years five of them retire, by lot, or in such other way as the Council may determine.

The members of the Assembly are elected for four years; and the Governor has power to summon, prorogue, or dissolve the Assembly as he may think fit. The Governor is also empowered to designate certain offices, not being more than six in number, to be political offices, held by ministers of the Crown. Provision is also made for a reserve of the public revenue, towards defraying the expenses of the Governor, and ministerial salaries, and for the promotion of the welfare and education of the natives.

There are thirteen electoral districts in the colony, viz.:—Pietermaritzburg and Durban Boroughs, Durban County, Lion's River, Umgeni, Ixopo, Klipriver, Newcastle, Victoria, Umvoti, Weenen, Alexandria and Alfred. The possession of property to the value of £50, or the payment of an annual rental of £10, entitles a man to vote. Inhabitants of three years' residence in the colony, whose income, including allowance, is equal

when water was scarce and costly, the diamonds were won by "dry-sorting" the pulverized ground, and the resulting "débris," scattered over a large area of the townships, has since been nearly all washed with more or less of profit to the workers. The modern washing-machine consists of four essential parts, a hoist for lifting the dry pulverized ground from the floors, a puddling cylinder, in which it is mixed with water, an annular pan with revolving arms and teeth, and an elevator for getting rid of the tailings.

"The diamond occurs in all shades of colour, from deep yellow to pure white, from deep brown to light brown, and in a great variety of colours—green, blue, pink, brown, yellow, orange, pure white, and opaque. It is the hardest of known substances, and has a specific gravity of 3.52. The stones vary in size from that of a pin's head to the size of the cut given below. This diamond weighed 428½ carats in the rough (a carat weighs 3.17 troy grains), and is the largest stone ever found in the four mines. It measured 1½ inches through the longest axis, and 1½ inches square. The following cut represents the size and shape of the stone as found:—



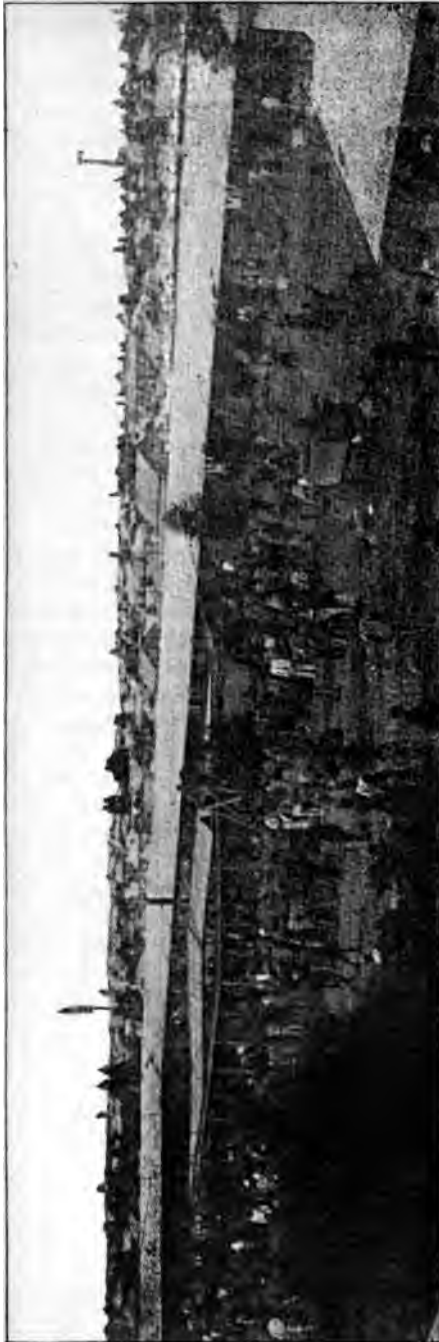
428½ Carats.

"It was found in the De Beers Mine by a native, whose 'brother' gave information which led to its recovery, while being taken from the mine. It was cut and exhibited at the Paris Exposition, 1889. Its weight after cutting was 228½ carats, having lost 200 carats in the process of cutting.

"After assorting at the pulsator, the diamonds are sent daily to the general office under an armed escort, and delivered to the valuers of the Diamond Department. The first operation is to clean the diamonds of any extraneous matter by boiling them in a mixture of nitrate and sulphuric acids. When cleaned, they are carefully assorted with reference to size, colour, and purity. Parcels are then made up, and when valued are sold to local buyers, who represent the leading diamond merchants of Europe. The size of a parcel varies from a few thousands to tens of thousands of carats. In one instance, two or three years ago, nearly a quarter of a million of carats were sold in one lot to one buyer.

"In order to prevent illicit traffic, the quantities of diamonds found are reported to the Detective Department, both by the producers and by the exporters. All diamonds, except those which pass through illicit channels, are sent to England by registered post. The weekly shipments average from 40,000 to 50,000 carats."

The "compounds" for the native labourers employed in the mines are peculiar features of the Fields. Both at Kimberley and De Beers these compounds, consisting of rows of buildings of corrugated iron, forming four sides of a square enclosed with a high fence, cover several acres of ground. Within these areas, the natives are confined during their term of service which is generally for three months, at the end of which time many of them re-engage for further periods. Wood and water are furnished free; a large swimming bath is provided; and the sick are taken care of in a hospital where medical attendance, nurses, and food are supplied by the Company. Wages are paid to the men wholly in money, and within the compounds there are several stores furnished with all the necessaries of life, where they can purchase food, clothing and whatever they require. No alcoholic liquors in any form are allowed to them, and during the period of service they are strictly guarded against having any communication with the world outside the compound. The natives are thus provided with wholesome food and healthy quarters, protected from indulging in poisonous liquors, and by a system of close personal surveillance and systematic searching whenever they come up from the mine shafts to the surface, their opportunities or chances of stealing or concealing diamonds are materially reduced. Among these natives are to be found types of all the tribes of South Africa—Kaffirs, Basutos, Zulus, Bechuanas, Matabele, Fingoes, Shangains, Makalakas, &c., and in the open square of the compounds, the visitor who watches the groups of ebony figures draped in blankets, chatting,



DE BEERS COMPOUND, KIMBERLEY.

laughing, gambling, feeding, or sleeping in every imaginable pose, may attain a more realistic picture of native life than anywhere in the interior of the Dark Continent.

The European employes of the Company are free to live where and how they please; but a model village for the accommodation of a number of them, has lately been designed and erected at Kenilworth, near De Beers. Four or five years ago, Kenilworth was nothing but an extensive patch of barren land. Now it is covered with trees, thirty to forty feet high. Roads and streets have been laid out upon it, and comfortable red-brick cottages built, each with its shrub-clad porch, verandah and flower garden. There were fifty houses occupied towards the end of 1892, and more were in course of erection. Portions of these were for married men and families, others were quarters for single men. The rent of a four-roomed house, with kitchen, offices, and water laid on is from £4 10s. to

£5 monthly. Single men have their rooms from £1 a month and 25s. per week for board. At the entrance of the village are a church, and a club house, the latter containing, besides a large common dining-room, an excellent reading room, where books, magazines, and newspapers are kept, and also a billiard room with two good tables, the gift of some of the life-governors of the Company. Adjoining the village an orchard has been planted and about thirty acres of ground covered with 4,000 fruit trees—peach, apricot, apples, pears, plums, &c.—already bearing fruit although only in their second season. This orchard is intended to furnish the villagers with fresh fruit at reasonable prices, and any surplus will supply the compounds.

A few words must be added about the mines and diggings outside the control of the De Beers Consolidated Mines. This Company owns the whole of Kimberley and De Beers Mines, and the greater portion of Dutoitspan and Bultfontein, but is at present doing no work in either of the latter mines. Mining operations had to be suspended owing to reef falls, and the results of the last year's washing were not very satisfactory. The yield from Dutoitspan Mine was $14\frac{14}{100}$ carats per 100 loads, and from Bultfontein Mine $16\frac{6}{100}$ carats, being the average results obtained from over half a million loads washed from each mine.

In Dutoitspan Mine there are only two companies outside De Beers, viz., the *New Gordon Diamond Company, Limited*, and the *British United Diamond Mining Company, Limited*. The former Company has acquired a large number of new claims on the eastern extension of the mine, in addition to the previous holding on the north reef, and has sunk a large shaft outside the mine, with which it is connected by a tunnel at a depth of 260 feet. Some interesting light has recently been shed on the geological formation of Dutoitspan Mine. At a depth of about 300 feet below the red soil, the Gordon Company has struck quartzite in a drive and pass from its No. 2 shaft, which would appear to indicate that the melaphyre is absent in this mine, a fact (if verified) of considerable importance to the future profitable working of the mine. The Gordon was one of the earliest companies formed in this mine some twelve years ago, and was known to possess some of the richest claims. The Company was reconstructed under its present title in March, 1891, with a capital of £410,250, and now owns 435 claims, about half of which are on the "extension," and therefore still in yellow ground. It is well equipped with machinery of modern type, including a new design of washing gear, in which it is intended to treat the maiden "blue" as it comes from the mine without previous depositing. The

operations of the Company have been much hampered by a great accumulation of water in the mine, estimated at some 60,000,000 gallons, consequent on the stoppage of work in the De Beers claims, and the question as to who shall remove this water is still under consideration by the law courts. The head offices of the Company are in London.

The *British United Company* owns some 70 odd claims on the south reef which are not being worked at present owing to reef troubles. The stoppage of Dutoitspan Mine has caused considerable loss and distress to the tradespeople and population of Beaconsfield, which was a flourishing township in the days when its two mines were in full operation, but it could hardly be expected that De Beers should work these poorer mines at little or no profit, as long as it can win all the diamonds it requires from the two richer mines.

In Bultfontein Mine, apart from the claims of King, Neumann, and Wernher, there is only one independent company left, the *North Eastern Bultfontein, Limited*. This company has done a considerable amount of development, and has erected powerful machinery to work a large block of new claims taken out on the northern extension of the mine. Both these claims, and those of the Dutoitspan extension, are maiden ground, and do not appear on the old plans of the mines.

The North Eastern Company has sunk three shafts through the maiden blue ground to depths of over 500 and 600 feet. Two of these shafts are connected at the latter level, at which some 3000 feet of tunnels and passes have been opened out. A large block of claims is also being worked in the open, from which at date of writing the chief supply of blue is being drawn. The drives from the North Eastern Company's shafts at the 600 feet level have struck the quartzite, but the depth of the shales is not known, nor has it been ascertained whether the melaphyre exists in this mine. The North Eastern property consists of 671 claims. The size of a claim in both Dutoitspan and Bultfontein Mines is 30 feet by 30 feet, for which a monthly rental of thirty shillings per claim is paid to the landlords, the London and South African Exploration Company, Limited. Each claim carries with it one acre of depositing floor, so that the floors of the two mines cover five or six square miles of country. The North Eastern Company derive their water supply for washing purposes from the "Pan," a natural basin which receives the surface drainage from the surrounding country, and which of late years has grown into a lake of imposing dimensions. A similar lake of smaller size, known as Blanckenberg's Vley, exists about a mile to the north

of Dutoitspan Mine, from which the New Gordon Company has the right of pumping.

The *Saint Augustine's Mine*, so called from the church of that name which stands on the property, was "rushed" some 12 years ago in the days of the first "boom," and is now owned by a London Company, which has erected powerful machinery and done a considerable amount of development down to a depth of 800 feet from the surface, all the mining being underground, but very little is known publicly as to the results obtained.

Otto's Kopje is another mine that was rushed in the "boom" of 1880, and after standing idle for many years is now the property of the Otto's Kopje Diamond Mines, Limited, a company recently reconstructed in London with a capital of £500,000, which holds some 500 acres under lease from the Cape Government, including two mines lying a couple of miles to the west of Kimberley. No. 1 Mine has been prospected by means of a shaft sunk to a depth of 1200 feet into the "blue," but the new management is devoting its energy to the exploitation of No. 2 Mine, which it is proposed to work on a large scale as an open mine in the yellow ground, for which purpose extensive machinery is shortly to be erected.

There are several other mines in Griqualand West, most of which were rushed twelve years ago and soon after abandoned, but some of them are now being reopened in the hope that they may prove payable under the cheaper conditions of working which obtain to-day. But more important than any of the outside mines mentioned above is the *Premier Mine* (Wesselton), which was only discovered in the latter part of 1890, though it lies within a mile eastward of Dutoitspan Mine, on the farm Benauwdheidsfontein, part of the Wessels Estate, which has been known for years to contain diamonds, and has been prospected right and left any time these last twenty years. The mine had been overlooked owing to the absence of the ordinary surface indications. It lies in a slight depression, whilst most of the other mines were originally "kopjes," or slight hillocks, and the diamondiferous soil is covered by a thick deposit of 8 feet or 12 feet of tufaceous limestone. It had actually been used as a depositing site for the dry rubbish of the township of Beaconsfield. The coach road from Kimberley to Bloemfontein passes over the estate, which comprises fifteen farms of a total of 52,000 acres, and is cut in two by the boundary line of Griqualand West and the Orange Free State, only 6000 acres lying within Colonial territory; but the whole estate is held under a Free State title. In spite of this the Premier Mine was "rushed" in the early part of 1891, but the rushers were subsequently turned off as

trespassers, and the mine reverted to Mr. H. A. Ward, who had acquired the prospecting rights on the whole estate. He has since entered into an arrangement with the De Beers Consolidated Mines, Limited, whereby the latter company have purchased the entire Wessels Estate of fifteen farms, including the Premier Mine, for the sum of £303,000. Mr. Ward's part of the bargain gives him the right to mine and wash for his own benefit 5,000,000 loads of yellow ground in the five years 1892 to 1896, out of which he has to pay back to De Beers half the above purchase price and interest on the whole at 9 per cent. per annum. He is also bound not to sell more than 20,000 carats of diamonds per month.

There are 1125 claims in the Premier Mine, which after deducting the area covered by "floating reef," will yield the prescribed quantity of 5,000,000 loads by taking out the yellow ground to a depth of about 70 feet. This will still leave a large amount of "yellow" to be treated by De Beers, besides all the blue ground, which Mr. Ward is not allowed to touch. Owing to the great facilities of working top stuff, which is hauled from the mine up inclined tramways, and tipped direct into the washing machines, the yellow ground can be treated at a cost not exceeding 1s. 6d. per load, which on a low estimate of its value will leave a nett profit of 2s. 6d. per load, so that Mr. Ward is likely to make about half a million sterling by his bargain. On the other hand, the property acquired by De Beers is remarkably cheap, and a magnificent addition to the assets of the Company. At present there is ample water in the mine for washing purposes, but the greater part of the "Pan" falls within the property, and is a most valuable water-right.

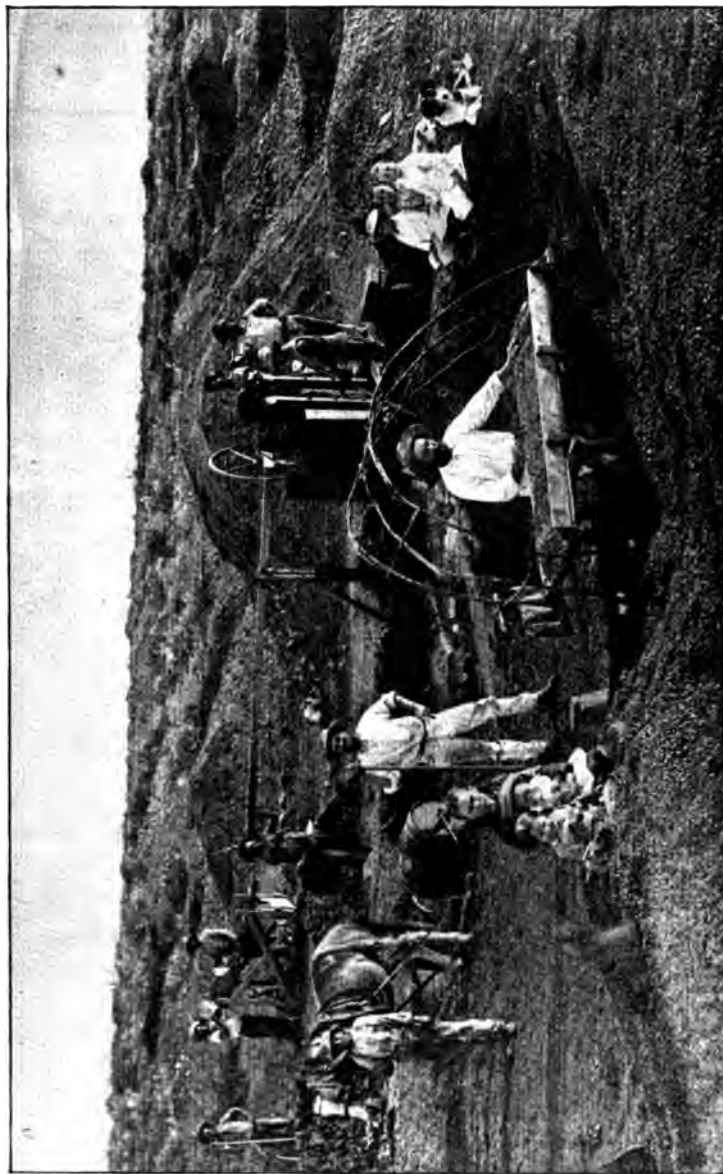
As already mentioned, there are several diamond mines within the Orange Free State, most of which have been worked spasmodically for many years past. The only mine of real importance is *Jagersfontein*, which was discovered twenty years ago, and after passing through numerous ups and downs is now the sole property of the New Jagersfontein Mining and Exploration Company, Limited. The capital of this Company is now £1,000,000, and in addition to holding the entire mine the Company owns the total number of shares in the Jagersfontein Mining and Estate Company, Limited, which pays 6 to 8 per cent. yearly on its capital of £100,000, being the proprietor of the farm and drawing licences from all the stands in the township, as well as recovering one half of the claim licences collected by the Government. Amongst the other assets of the Company are 10,000 £5 shares in the De Beers Consolidated Mines, and a remarkable brilliant of 55 carats found originally in the claims of the Jagers-

fontein United Company and taken over on amalgamation. It was previously known as the "Pam" brilliant, but is now called the "Jagersfontein." It weighed in the rough about 112 carats, and is valued at £25,000, being at present on view and for sale at Messrs. R. & S. Garrard & Co., the Haymarket. Some short time since the Queen telegraphed for the brilliant to be sent to Osborne with the intention of purchase, but the untimely death of the Duke of Clarence put a stop to the transaction. During the financial year ending 31st March, 1892, the New Jagersfontein Company washed 1,156,095 loads of ground, producing 110,171 carats of diamonds, realised and valued at £195,271 4s. 9d., being an average yield of over 9½ carats per 100 loads of blue, and an average value of over 35s. 6d. per carat. The average price realised for Kimberley and De Beers diamonds during the fifteen months ending 30th June, 1892, was 25s. 6d. per carat, so that it will be seen the Jagersfontein diamonds are some 30 or 40 per cent. better in quality than those of De Beers. The yield of diamonds from De Beers blue is, however, about ten-fold that of Jagersfontein. Still the latter mine is being worked at a good profit, and with increasing depth the ground is said to increase in value, whilst the working expenses have been reduced to about 2s. 3d. per load, which is a high testimony to the ability and efficiency of the management. The mine has been entirely worked on the open quarry system.

The only other Free State mine deserving mention is *Koffyfontein*, situated on the Riet River, about fifty miles south-east of Kimberley, in a direct line between there and Fauresmith. The Koffyfontein Farm is owned by the London and Orange Free State Exploration Company, who bought it from Mr. Rorich in 1880 for £80,000. A number of companies were formed at that time to work the mine, but all came to grief. In November, 1889, after having remained unworked for several years, the claims were sold by public auction in Kimberley, when 1187 claims realised £70,772, 300 claims being kept in reserve by the proprietors of the farm. The mine was once more proclaimed a public digging, and several new companies set to work. The finds of diamonds registered from December, 1887, to April, 1891, amounted to 9912 carats, valued at £14,640, or an average of nearly 30s. per carat. Elaborate waterworks have been constructed on the Riet River, for which hitherto there has not been much use, as the mine was again abandoned soon after their completion. Last year (1892) the Free State legislature passed a law declaring the working of claims in Koffyfontein compulsory, under penalty of forfeiture, which has partly induced a return of activity at this mine, where several parties of diggers

are once more at work. Besides this, a block of 1000 claims has been taken up by an English syndicate, who intend to thoroughly test the mine on a much larger scale than has ever been attempted before.

The town of Barkly West, pleasantly situated on the right bank of the Vaal River, twenty miles north-west of Kimberley, is the centre of the River Diggings, which extend up and down the river on both banks, a distance of some seventy miles from above Hebron to its junction with the Harts. These diggings are very unlike the Kimberley Mines, being all in alluvial soil, a heavy deposit of ferruginous gravel mixed with red sand, lime, and boulders, that has been washed into the crevices of the rocks by the action of the river, which has cut its way through a hard volcanic rock, probably diabase, which stretches for miles on either bank and extends from near Potchefstroom almost to the junction of the Vaal and Orange Rivers. There is little doubt that this rock is identical with the "hard rock," or amygdaloidal melaphyre, of Kimberley Mine. The Kimberley shales thin out and vanish as the Vaal River is approached, and the great sheet of melaphyre appears there on the surface. Whether the diamonds which the heavy deposit contains have been formed *in situ*, or whether they were brought from a distance, is still a vexed question, but the balance of evidence is in favour of the former hypothesis. Most of the diggings are very shallow, but in some cases they are nearly a hundred feet deep before the bed rock is reached. Several companies have been formed at various times for working the deep alluvial, but they have not been very successful, and the fact appears to be that the River Diggings are poor men's diggings, which yield a fair return to hard-working individuals, but which do not justify the outlay of much capital. They are still being worked very much as they were twenty years ago, and the original digger is still to be found there with all his primitive appliances, living his free arduous life, often with but scanty fare, and occasionally diversified by a trip to Kimberley. The result of amalgamation has been to increase the activity at the River Diggings, where there are now probably nearly a thousand white men at work, in addition to their native labourers. In 1889 the Government revenue from claim licences, &c., amounted to a little over £6000, being an increase of £1000 on the revenue received in 1888, whilst in 1890 it rose to £9500. The approximate weight of diamonds found at all the River Diggings has remained pretty constant for several years past, having seldom much exceeded 30,000 carats per annum, that is, about one per cent. of the production of the Kimberley Mines, but the quality of the river stones is superior even to those of Jagersfontein,



BORTING GRAVEL AT WALDEK'S PLANT, VAAL RIVER.

[To face page 354.

11

being generally about twice the value of the average price realised for Kimberley stuff. During the year 1890 the approximate weight and value of diamonds imported into Kimberley from the Barkly Division were 28,122 $\frac{3}{4}$ carats, valued at £79,231 11s. 3d. (data supplied by the Detective Department), equal to 56s. per carat. The value of the production of the Kimberley Mines during the same period was only 31s. 1 $\frac{1}{2}$ d. per carat.

There are a number of Dry Diggings in the Barkly District, similar in formation to the Kimberley Mines, but none of them has proved payable.

It is only since the establishment of the Board for the Protection of Mining Interests in 1882 that accurate statistics have been compiled of the value of the production from each mine, and also of the imports of diamonds into and exports from Kimberley, but from the Postal and Customs Returns an approximate estimate may be formed of the production prior to 1882. Comparing all available sources of information, it may be confidently stated that we have exported to date (1893) over 50 million carats of diamonds, of a total value of seventy millions sterling. As about five million carats go to a ton, the weight of diamonds exported has amounted to over ten tons. If piled into a heap, they would form a pyramid 6 feet high, with a base 9 feet \times 9 feet; or they would fill a box 5 feet \times 5 feet \times 6 feet.

The above estimate of the total value of diamonds exported to date makes a small allowance for the diamonds known to have been exported through private and illicit channels. The Official Return of diamonds exported from the Cape Colony, compiled by the Collector of Customs, gives the total value, for the twenty years from 1872 to 1891 inclusive, at £58,110,923. To this must be added at least a couple of millions for diamonds exported prior to 1872, and a further four millions for the exports of 1892, making a total of sixty-four millions sterling from the discovery of the Fields, so that the above estimate of *seventy millions* assumes only ten per cent. to have been illicitly exported, which is probably far below the actual figure.

For the past five years the value of diamonds exported has remained at between four and four-and-a-quarter millions per annum, and this appears to be the maximum value the market can take without unduly affecting the price.

It has been shown in the previous pages how the control of the diamond industry has gradually passed into the hands of a powerful Corporation, which for the first time in the history of the Fields has enabled shareholders to depend on reasonable and regular dividends.

Meanwhile there is no doubt the trade and population of Kimberley and Beaconsfield have declined from what they were some years ago; but it must be borne in mind that many causes have been at work, in addition to the amalgamation of the mines, which largely account for this shrinkage. The northern extension of the railway is one cause, the rise of Johannesburg and the transfer to that place of the share market from Kimberley is another.

The permanence of the leading industry of the Colony, however, is now assured, and, with a yearly expenditure of about a million sterling at the mines, there will always be steady employment for a large number of men at good wages, and a considerable amount of trade.

CHAPTER XVI.

THE COLONY OF NATAL.

THE territory forming the British Colony of Natal, on the east coast of South Africa, was first discovered by Vasco de Gama during the celebrated voyage in which he found his way round the Cape to India. From the coincidence of its having been sighted on Christmas Day, 1497, he called it "Terra Natalis," which name has grown into the one now in use. About two centuries later, the Dutch, who were established at the Cape, gained some knowledge of the place from mariners who had been shipwrecked there; and, by a formal purchase from a native chief, they added the port of Natal to their South African possessions, but no steps were taken to establish any permanent settlement in the country. It was left unnoticed until nearly the end of the first quarter of the present century, when some of the English then settled on the Cape frontier were attracted to it by the love of adventure. They engaged in elephant-hunting and trading for ivory, and a few of them had friendly intercourse with the Zulu chief, Chaka. Among the early pioneers were Mr. Henry Fynn, Lieutenants Farewell and King, Messrs. Isaacs, Cane, Ogle, and others, who secured from Chaka a concession of the coast north and south of the port, with all the country extending a hundred miles inland. They urged upon the Governor of the Cape, Lord C. Somerset, the advantage of establishing a British colony there; but the latter declined to authorise the enterprise.

The Europeans, however, held their own amidst the savage population around them, although the lives of some of their number, including that of Lieutenant Farewell, were sacrificed by native treachery. In 1835, Captain Allen Gardner visited Chaka's successor, the chief Dingaan, on a missionary tour to the Zulus, and concluded a treaty with him on behalf of the English settlers. The residents at the port then laid out the town of Durban, and petitioned the Crown that their settlement might be recognised as the colony of "Victoria." To their petition, the Government replied that, with every disposition to appreciate the benefits of an extension of commerce, the finances would not allow of any additional expense for a new settlement. After this, the emigration of Dutch farmers from the Cape Colony set in, with the stirring incidents connected with the "Boer trek," as elsewhere related.

In 1843, after the formal submission of the Boers and the assumption of sovereignty by Great Britain, the Colony of Natal was, for a year or two, placed under the Cape Government. But this arrangement did not answer; the officials at the Cape were ignorant of the wants of the country, and could not satisfactorily legislate for it. In 1848, letters patent were issued constituting the territory a separate Government, under a Lieutenant-Governor and Executive Council, Mr. Martin West being appointed as head of the Government.

The European population was then almost reduced to the original elements. There was little trade, and very little revenue. About 100,000 natives were spread throughout the country, and their numbers were being continually augmented by refugees from Zululand. A Commission was appointed to consider plans for bringing them under European management and control. The course recommended by the Commission was, that the natives should be placed on reserved lands, named "locations," in different parts of the colony. But an essential feature of their proposal was, to establish at once among these communities, qualified European functionaries to control and guide them through the serious ordeal incidental to their progress from barbarism to civilisation. Upon this depended the success of the scheme. The carrying out of it, however, required money, and no money was to be had. The natives were thus left to themselves, with none of the restraints of civilisation, beyond what the teaching of Christian missionaries inclined them to adopt.

The letters patent of 1848 directed that the organisation existing among them should not be disturbed,—that there was to be neither interference with nor abrogation of any law, custom, or usage prevailing amongst them previous to the assertion of authority over the district, except so far as the same might be repugnant to the general principles of humanity recognised throughout the whole world. In pursuance of this instruction, in 1849 an ordinance was passed, conferring upon the Lieutenant-Governor all the authority of a Supreme Chief over the natives, and empowering him to administer native law among them, through officers he saw fit to appoint, such as the Secretary for Native Affairs, the magistrates, and petty chiefs. The old tribal polity was thus maintained within the colony. The hereditary chiefs were looked to and held responsible for the good order and government of the people, who were left to grow up as a pagan community.

The necessity for strengthening the European population became apparent; and efforts were made to direct attention to the suitability of the country as a field for British emigration. A gentleman, named Byrne, who had visited it in 1843-44, organised

a scheme for the introduction of settlers, engaging to furnish a steerage passage, with twenty acres of land after arrival, for the sum of £10 per statute adult. He travelled about England, delivering lectures on emigration, and especially on the advantages Natal presented to men of small capital. The result was that, between 1848 and 1850, thirty-five vessels arrived, bringing 3,792 emigrants. Their expectations, in many instances, were disappointed. The twenty-acre settlements were not in general suited or sufficient for cultivation, and those who could earn a livelihood otherwise than by agriculture, abandoned them and took to trades and other occupations. After the first vicissitudes had passed, many successfully established themselves in the land of their adoption, becoming in course of time thriving and wealthy colonists. Crude and ill-managed as this emigration scheme was, it contributed to set in motion towards this part of South Africa some portion of the stream of European life which was flowing to other lands. The capabilities of Natal were partially developed, and it was proved that sugar, coffee, arrowroot, and other inter-tropical products could be profitably cultivated over a considerable extent of its coast lands.

On the death of the first Lieut.-Governor, Mr. West, in 1849, the administration for a short time devolved upon Lieut.-Col. Boyes, but in 1850 Sir B. C. C. Pine was appointed to the office. The colony was then divided into six counties, each having local councils for the management of district affairs; and in the two chief towns, Pietermaritzburg and Durban, municipal corporations were established.

In 1855, Sir G. Grey, as High Commissioner, visited the settlement. He was directed by the Secretary of State to inquire into and report upon two subjects,—one, the removal of a portion of the native population; the other, the introduction of representative government. Mr. T. Shepstone, the Secretary for Native Affairs, had submitted a plan to relieve Natal of its native difficulty, by drawing off half of its increasing Zulu population into the unoccupied territory south-west of the colony, near the St. John's River, where he proposed to establish rule over them, and as their chief to govern them according to their own laws and customs, so modified from time to time, as gradually to ameliorate their condition. The scheme did not find favour with Sir George Grey, who considered it most undesirable, under any circumstances, to collect ordinary barbarians in such large masses, and he advised that neither directly nor indirectly, should any encouragement be given to the measure; and his policy in so doing was approved of by the Secretary of State.

The proposition for granting representative institutions to

Natal originated with Sir B. C. C. Pine, who urged, that with a singularly popular constitution at the Cape, and with free republics on its borders, it was impossible to delay the grant of a representative legislature, and the sooner it was conceded, the more moderate and safe might its character be made. Sir George Grey, after acquainting himself with the wishes of the inhabitants, whom he found peculiarly distinguished by "intelligence and prudence," recommended that a Legislative Council should be given to them. The European population at this time was estimated at 8,500.

In 1856, Mr. John Scott was appointed Lieutenant-Governor, in succession to Sir B. Pine, and to him was assigned the duty of inaugurating the new constitution. His term of office extended until 1864. During these years the colony enjoyed a considerable degree of prosperity, and made marked progress. Immigration was encouraged. Private enterprise engaged in the new industries of sugar, coffee, and cotton-growing; and as the irregular and unskilled native labour supply could not be relied upon for the success of these undertakings, Coolies were introduced from India. The prospects of Natal were considered good; and through the formation of various joint-stock associations, foreign capital and credit were introduced and liberally made use of. In 1866, however, the face of affairs changed. Many of these enterprises failed to realise the expectations with which they had been set on foot, and were discontinued or carried on at a loss. A commercial crisis had to be passed through, and trade and the public revenue showed a marked decline.

Colonel Maclean succeeded Mr. Scott in the government, but he soon succumbed to ill-health, and his place was temporarily filled by Colonel Bisset, as administrator, until in 1867, Mr. Keate was appointed Lieutenant-Governor. Soon afterwards, the Government and the Legislature came into collision upon the equalisation of the revenue and expenditure. The representative members in Natal, as in the Cape Colony, complained that they had no control over the administration. The aspirations of many of them were for responsible government. But Earl Kimberley informed them, that in the case of a colony like Natal, where a handful of white settlers were surrounded by a warlike population, the objections to that form of government were of a serious character; and as the Crown was responsible for the protection of the colony and the government of the native population, it must have secured to it the means for carrying on the business of the administration.

In 1873 the office of Lieutenant-Governor was again filled by Sir Benjamin Pine, who had administered the affairs of the settle-

ment eighteen years previously, and who was heartily welcomed by the old colonists. Trouble then occurred with the Amahlubi tribe, under the chief Langalibalele, whose people had obtained guns at the Diamond Fields, and refused to bring them into the magistrate's office for registration, as required by law. An expedition was despatched against them, whereupon, they sought to escape into Basutoland by the Bushman Pass, and, in attempting to stop their progress, three of the Natal Carbineers and two natives were shot. The chief and his sons were subsequently captured and tried for rebellion against the Supreme Chief, and sentenced to banishment and imprisonment for various periods, and the tribe was broken up. The Bishop of Natal (the late Dr. Colenso) espoused the cause of the chief and his tribe, and the attention of the home authorities was directed to the system of native administration. Sir B. Pine retired, and Lord Wolseley was sent out as temporary Governor, accompanied by Colonel Colley, Major Brackenbury, Major Butler, and Lord Gifford. The General and his brilliant staff inquired into the affairs of the colony, and the relations existing between the Europeans and natives, with the result that they deprecated in strong terms the sensational stories which found credence in England respecting the ill-treatment of the latter. The natives of Natal they described as "well off in every sense, and as a people far in advance of those not living under British rule." General Wolseley's special mission, however, was to strengthen the power of the Executive in the Legislature, and this was secured by an increase of the nominee members. In August, 1875, he was succeeded by Sir Henry Bulwer, who, in the following year, at the instance of Lord Carnarvon, the Secretary of State, introduced modifications and changes in native administration, with a view to bring the native races more closely under the influence of civilised law and life, and in addition, he initiated the construction of railway works from the port to the uplands, which inaugurated a new era in the history of the colony.

External events, however, seriously affected its progress for some years afterwards. The annexation of the Transvaal, the Zulu War, and the Transvaal War—elsewhere referred to—all exercised a disturbing and baneful influence, although for a time the war expenditure caused an inflation of local business, and augmented the public revenue.

From the position of the port of Natal, as the nearest gateway from the south-east coast to various parts of the interior, along a healthy line of communication, its chief towns have long been emporiums for what has been termed the "Overberg," or inland trade. Portions of the South African Republic and the Orange

Free State, as well as the Native Territories to its right and left along the coast, opened up channels of commerce which contributed to swell the imports and exports, and furnished employment in transport, by rail or wagon, to the enrichment of the colony. This has been an important factor in the growth and development of Natal during the fifty years of its existence. The remarkable progress it has made in this period will be best illustrated by the following statement of its revenue and trade:—

	Revenue.	Imports.	Exports.
	£	£	£
1850	32,112	111,015	32,112
1860	77,480	354,987	77,480
1870	126,293	429,527	126,293
1880	582,715	2,336,584	582,715
1881	600,177	1,331,115	960,029
1888	990,614	2,890,468	1,417,871
1890	1,507,788	5,164,772	1,582,228
1892	1,392,455	3,690,734	1,354,885

The present amount of the public debt of the Colony (the greater part of which has been spent upon railways and harbour), is £7,170,354 Os. 4d., bearing interest at the rate of about 4 per cent. The principal sources of revenue are customs, railways, hut tax, land sales, land revenue, mail and telegraph service, excise duties and stamp duties. The approximate valuation of properties for taxation purposes is £11,395,000.

The area of Natal is 20,460 square miles. Its population at the census of 1891 numbered 555,576 persons. Of these the Europeans or whites were 42,759; the Indians, 43,070, of whom 30,000 were free and about 10,000 indentured, and the aboriginal tribes were returned as 469,747 souls. Out of a total European male population of 24,795, there were 13,037 between the ages of 18 and 55, or more than half of the number available for military service. Those engaged in agricultural and pastoral pursuits were returned as 3,325, while the industrial class, including artisans and mechanics, counted 6,628. The birth-places of this population showed 11,434 from England and Wales; 3,226 from Scotland; 1,000 from Ireland; 2,269 from European countries, the residue being chiefly Natal and South African born.

The Government, at present,* is administered by Sir Charles

* While these pages were in the press, Sir Charles Mitchell was appointed Governor and Commander-in-Chief of the Straits Settlements, to be succeeded as Governor of Natal by Sir W. F. Hely-Hutchinson, K.C.M.G., Governor of the Windward Islands.

Bullen Mitchell, K.C.M.G., who is Governor, Commander-in-Chief, Vice-Admiral, and Supreme Chief over the native population. He has been assisted by an Executive Council, together with a Legislative Council, composed of thirty-one members, twenty-four of whom were elected, five officials, and two nominated by the Governor. But a change in the constitution of the Colony is now taking place. The electors, by a slight majority, have declared in favour of an advanced form of government, which will harmonise their position with that of their fellow-colonists at the Cape and in other parts of the Empire, and the Imperial Government has signified its consent. Measures for the establishment of responsible government are, therefore, in course of progress.



SIR CHARLES BULLEN MITCHELL,
K.C.M.G., GOVERNOR OF NATAL
AND ZULULAND.

The Legislature is, in the future, to consist of two Chambers—a Legislative Council composed of eleven members, nominated by the Governor-in-Council and a Legislative Assembly of thirty-seven members, chosen by the electors. The qualification of members for the Council is, being of the age of thirty years, resident in the Colony for ten years, and registered proprietor of unencumbered property of the value of £500. They hold their seats for ten years, but at the end of five years five of them retire, by lot, or in such other way as the Council may determine.

The members of the Assembly are elected for four years; and the Governor has power to summon, prorogue, or dissolve the Assembly as he may think fit. The Governor is also empowered to designate certain offices, not being more than six in number, to be political offices, held by ministers of the Crown. Provision is also made for a reserve of the public revenue, towards defraying the expenses of the Governor, and ministerial salaries, and for the promotion of the welfare and education of the natives.

There are thirteen electoral districts in the colony, viz.:—Pietermaritzburg and Durban Boroughs, Durban County, Lion's River, Umgeni, Ixopo, Klipriver, Newcastle, Victoria, Umvoti, Weenen, Alexandria and Alfred. The possession of property to the value of £50, or the payment of an annual rental of £10, entitles a man to vote. Inhabitants of three years' residence in the colony, whose income, including allowance, is equal

to £8 per month or £96 per annum, are also entitled to vote. No person belonging to a class, which is placed by special legislation under the jurisdiction of special Courts, or is subject to special laws and tribunals, is entitled to electoral privileges; but provision is made that male natives, who for seven years have been exempt from native laws, customs and usages, and who obtain a certificate to that effect from the Governor, and possess the property qualification, may be registered as electors and vote.

The Administration of Justice is in the hands of the Judges of the Supreme Court and Resident Magistrates. Each county is divided into certain districts, every one of which is supervised by an officer termed a field-cornet. There are also Dog Tax Inspectors, and, in districts where sheep-farming is carried on, Sheep Inspectors, whose duty it is to see that the law against keeping diseased sheep is carried out. The organised forces of the Colony, exclusive of the Imperial troops, consist of the Natal Mounted Police, including one commandant, eight officers, and 280 men, maintained at a cost of £38,664; and the volunteer force, including mounted rifles, artillery, infantry and coast corps, number 1,835 men, on which the expenditure is £22,915. An annual contribution of £4,000 is also made for the Imperial troops.

The educational needs of the colony are provided for by the maintenance by Government of high schools at Maritzburg and Durban, primary schools in the chief towns, and a system of aid to farmhouse centres and private schools, which are subject to official examination and general supervision. A Council of Education controls the Administration, and the total actual expenditure is over £37,200 per annum. In 1891-2 there were 60 schools and 68 farmhouse centres under Government inspection, with an aggregate regular attendance of 6,399 pupils. Government night schools were opened in Maritzburg and Durban, but were relinquished owing to lack of pupils. A capitation grant is paid to the teachers as a bonus; it is a variable one, dependent on the progress and attendance of pupils. In 1892, it amounted to 11s. 3d. for every child; but it is subject to alteration yearly by the Council of Education. During the same period, Government aid was given to 73 native schools (which are chiefly promoted by missionary bodies) to the amount of £3,489 10s., giving a cost per child of £1 3s. 8d. The number of children on the register of these schools was 3,896, with an average daily attendance of 2,945. Industrial training is provided for at some of the schools and defined as "the teaching of trades or agriculture, or some productive labour that would enable the student to earn a living." Provision is also made for

the promotion of education among the children of the Indian immigrant population.

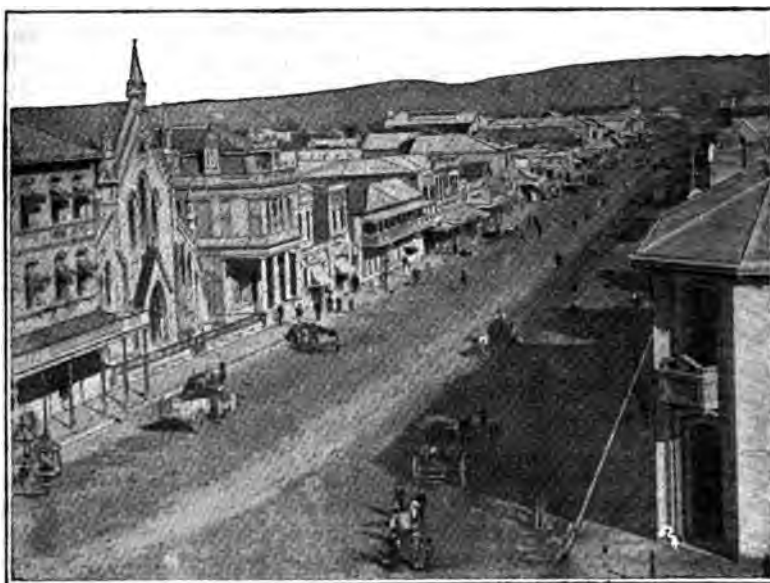
The Public Works Department, under the supervision of the Colonial Engineer, is responsible for the maintenance of the main roads in the Colony, of which there are about 3,000 miles; and also for the construction and repair of the numerous public bridges and buildings. Telegraph lines have been erected all along the railways, and to various other points, covering 566½ miles of line, with 76 offices. The Eastern Submarine Cable, connecting South Africa with Europe, has its terminal station at Durban.

Institutions and societies for the promotion of public objects are to be found all over the Colony, and testify to the public spirit of the inhabitants. The hospitals of Pietermaritzburg and Durban, and the lunatic asylum near the former city, are well-appointed institutions, and are maintained by Government funds and payments by inmates. Two botanic gardens, one in Pietermaritzburg and one near Durban, on the Berea slope, are supported partly by Government aid and partly by subscription. There is an interesting museum at Durban. Public libraries are to be found at most of the towns. Agricultural societies, planters' associations, and rifle associations are organized in each county. In most centres music, literary and debating and charitable societies, racing, cricket, football, lawn-tennis, fishing, and other clubs, as well as building and other benefit or friendly organizations, are generally to be found, contributing to the social and progressive needs of the inhabitants. The Colony is also particularly well off in regard to its newspapers, which are published both daily and weekly at Durban and Pietermaritzburg.

Durban, as the seaport of Natal, is a place of great commercial importance. The harbour consists of a land-locked tidal lagoon, or basin, formed between the promontory named the Bluff, running north-east, and a sandy tongue of land known as the Point, extending from the north, and nearly meeting it. The entrance, called the Bluff Channel, has a shifting bar of sand across it, and to remove this bar and maintain a sufficient depth of water for the ingress and egress of large vessels, have been the aim and object of the engineering works carried out by the Natal Harbour Board for the last ten or twelve years. During 1854 to 1881 the channel depth averaged only 6 feet 5 inches. From that time to the present there has been a gain of 7 feet 7 inches, and the value of the port has increased accordingly. The maximum draught across the bar in 1892 was for steamers, 19 feet 9 inches, and for sailers, 18 feet 3 inches. Numbers of steamers and vessels now enter the inside harbour, and only the large ocean mail-boats at present remain at the outer anchorage. Last

year (1892) the total tonnage of the port was 612,815 in tons net register, and of this 309,017 in steamers, sailers, men-of-war, and small craft entered the harbour. Inside, at the Point, there are admirable landing and shipping facilities. There is about 2,500 feet of wharfage, along which steamers and ships are moored, with spacious goods sheds and landing cranes. Railways communicating with the interior carry off the goods landed, and trucks laden with Natal coal discharge their contents into steamers alongside.

The town of Durban spreads over the flats around the bay, for a



WEST STREET, DURBAN.

distance of three or four miles, and then stretches up and over the wooded height called the Berea, which rises three or four hundred feet above sea-level. From this point a pleasing outlook is obtained of the town below, the lake-like bay, the channel-entrance, the surf-streaked bar, the dark bushy range of the Bluff, with the lighthouse at its extremity, and the Indian Ocean beyond. The Berea is the residential part of Durban, and is dotted over with handsome suburban villas and dwellings, environed with avenues and gardens, and embowered in shrubs and trees of luxuriant tropical growth. A tram-car service supplies easy communication from the Point to the summit of this charming suburb. The town

itself is one of the brightest and pleasantest in South Africa. A little more than thirty years ago it presented the appearance of a scattered village, its houses spread over the bush-covered surface of low sand dunes, with the open spaces between ankle-deep in loose sand. Now, it has macadamised and well-paved streets, lined with substantial spacious warehouses, shops, churches, clubs, banks and offices. A number of handsome buildings adorn its central thoroughfares, prominent amongst them being the Town Hall, with its spacious assembly-room, where the Chamber of Commerce, the Borough Council, the Post



TOWN HALL, DURBAN.

and Telegraph offices, and the Museum are accommodated; and adjacent to it, are the public buildings and gardens. Churches of all denominations abound. There are also several parks for athletic and other sports, and an excellent theatre.

The rateable value of property within the borough is £2,479,540, and the population numbers 27,492, including Europeans, Asiatics, and native servants. The European industrial class is very largely represented. The natives are merely employed for the rougher sorts of labour, and as house servants or porters. They are upon the whole very well conducted and trustworthy; but their great drawback is their disinclination to

stay in service for any continuous period. They come and leave as it suits their own sweet will. It was this consideration that led to the introduction of the Indian Coolie, indentured for a certain number of years. The natives, as a class, are by law precluded from the possession of firearms and ammunition, and from the use or purchase of spirituous liquors.

The capital and seat of government is at Pietermaritzburg, about 54 miles inland by rail from Durban. This city was founded by the Dutch emigrant farmers in 1839, and named after two of their leaders, Pieter Retief and Gert Maritz, but it is now



CHURCH STREET, PIETERMARITZBURG.

generally called Maritzburg. Its site is healthily and beautifully placed, forming part of an extended basin 2,218 feet above sea-level, the Zwartkop and Town hills enclosing it to the north, and the open valley of the Umsindusi river, extending to the south and east, with the lofty flat-topped Table Mountain standing out as a buttress in the distance. When first traced it was laid out in the rectangular manner characteristic of most South African townships. There are now within its boundaries twenty-seven miles of streets, most of them, like the business thoroughfare of Church Street, ornamented with trees shading the paths.

On the south-west side of the city stands Fort Napier, the military headquarters, where the troops and departmental corps are stationed. Facing this, at the upper end, is the commodious and central Railway station. Among other public buildings of note are Government House, the Post Office and Supreme Court, the Market House, the new Town Hall, and the Legislative Council buildings, with the marble statue of the Queen in front of it, which was erected by Natalians in honour of Her Majesty's jubilee. In close proximity there is also a handsome



LEGISLATIVE COUNCIL BUILDINGS, MARITZBURG.

memorial to the memory of the officers and men who fell in the Zulu war. In the Market Square there is another memorial, commemorating the colonists and natives whose lives were sacrificed during the Langalibalele disturbance. Maritzburg has of late years made marked progress as a residential city, and along the hills around it are many fine suburban residences, with slopes covered with groves and clumps of trees. The valuation of property within and around the city is £1,374,261, and the population numbers 17,286, of whom about 10,000 are Europeans.

Besides the seaport and the seat of government, there are centres of population at various townships and villages through-

out the colony, such as Verulam, Isipingo, Stanger, Umzinto, Stuartstown, Port Shepstone, Howick, Hanover, Marburg, Hermansburg, Weston, Richmond, Greytown, York, Nottingham, Harding, Pinetown, Estcourt, Colenso, Ladismith, Dundee, Pomeroy, Newcastle and Charlestown.

The lands of Natal are usually classified as coast lands, midlands, and uplands, the country rising rapidly from the sea in a series of terraces until the mountain range of the Quathlamba or Drakensberg is reached. The first terrace does not extend much beyond eight or ten miles inland from the coast, and has an elevation of 700 to 800 feet. This is the semi-tropical belt, where the air as a rule is humid and warm, and the products are sugar, tea, coffee, arrowroot, and fruits, such as the mango, pine-apple, banana, as well as oranges and lemons, which grow in profusion. The Indian corn, or maize, furnishes two crops in the year, the one gathered in August, and the second in January. The next terrace, the midlands, having an altitude of from 900 to 3,000 feet, varies much in character. The lower portion, stretching away for nearly twenty-five miles, has not been used for the growth of any particular crops with very successful results. The higher part, including portions of Maritzburg, Richmond, Howick, Greytown, &c., is exceptionally good. Maize, oat-hay, potatoes, and other vegetables are grown, while there is plentiful and excellent grazing for cattle; but sheep do not thrive so well, except on the higher elevations of the Lion's River and Ipoelala divisions. For some years past the cultivation of the Australian wattle-bark has been tried with success, and is becoming a favourite industry. In the uplands, with an altitude of from 3,000 to over 5,000 feet, sheep farming occupies the foremost place, and upon the whole is the most steadily profitable pastoral industry. On many farms the pastures ordinarily carry two sheep to an acre, and the average yield of wool is four to four and a half lb. per sheep. Klip River, Weenen, and Umvoti counties have the most numerous flocks. Stock-farming also does well on the uplands, in spite of occasional reverses to the horse and cattle-breeders, due to horse-sickness and pleuro-pneumonia. The stock embrace Friesland, Shorthorn, Ayrshire, Devons, and Alderney, but most of the cattle are crosses with the hardy small Zulu or native animals, which are able to endure any amount of rough treatment, and yield rich milk, although not much of it. Dairy-farming is receiving more attention at present. Valuable bulls for breeding purposes have been imported by enterprising colonists; but with disappointing results in some parts, as the animals rarely survive their transportation more than six months, and sometimes even less.

In 1891-92, the total return of stock in the colony was : Horses,

62,667 ; cattle, 714,347 ; sheep, 959,246 ; Angora goats, 66,758 ; other goats, 301,523 ; pigs, 45,736 ; mules and donkeys, 4,887. In the return of crops raised by Europeans, the yield of wheat is only 2,000 muids, or 6,000 bushels, principally raised in the counties of Klip River and Weenen ; Indian corn, 258,790 muids ; and Kafir corn, 8,443 muids ; oats, 7,073 muids ; oat-hay, 12,000 tons ; sweet potatoes, 68,889 muids ; common potatoes, 41,689 muids ; barley, 1,100 muids ; beans, 8,705 muids ; coffee, 69,286 lbs. ; and sugar, 26,111 tons. The yearly produce of native crops was estimated at 591,528 muids (a muid=3 bushels) Indian corn, 385,997 muids Kafir corn ; 10,356 muids potatoes ; 218,184 muids sweet potatoes ; 19,969 tons of pumpkins ; 1,200 lbs. coffee, and 46,777 lbs. tobacco.

Hailstorms are an unpleasant feature of the summer season, affecting the midland and upland districts of Natal, as well as the Transvaal and Free State. No law at present discovered governs their approach or extent ; they usually pass over a very limited area, leaving a well-defined track of destruction behind, wherever there are standing crops or fruit trees. Occasionally many years pass in a district without such a visitation, then again there may be three or four of these in a single summer. The severest on record in Maritzburg occurred in April 1874, at 3.30 p.m., covering an area of forty square miles, and doing great damage ; some of the stones being four and a half inches in diameter, and weighing fully a pound avoirdupois. Thunderstorms are also of frequent occurrence during summer.

By far the greater portion of the lands of Natal (exclusive of the reserved Native Locations) are now owned by private holders, and institutions like the Natal Land Colonisation Company ; but there still remains a portion of the Crown lands, which are obtainable on very easy terms. These lands are open for sale in freehold by public auction, at an upset price of 10s. per acre, payable in ten annual instalments, without interest. They are subject to certain servitudes with regard to roads, railways and minerals, and also to compulsory beneficial occupation by the purchaser, or his agent, for nine months in every year. Special selections, not exceeding certain limits, may also be purchased, but an auction sale must take place. The upset price in such cases is 20s. per acre, and the occupation clause is inoperative. Certain classes of land are also open to lease or licence for grazing purposes, in lots of from 500 to 5,000 acres, for any period not exceeding ten years, and subject to one year's notice to quit on either side. These leases have to be applied for in a similar manner as for the lands for sale, and are also put up to auction, the purchaser paying the first year's rent in advance. The ordinary prices of lands at the present time are :

On the coast, from £1 to £5 per acre; in the midlands, from 15s. to 30s.; and in the pastoral up-country districts, from 15s. to 25s. per acre. The extent of Crown lands already disposed of is about 8,650,000 acres; the amount set apart for native locations, 2,350,000 acres; and there is still available 2,500,000 acres.

The coal-fields of Natal are situated from 225 to 250 miles from the seaport. There are about twelve collieries at work; but the chief one is that owned by the Dundee Coal Company, which was commenced in 1889, and opened for work in 1890, and is now in junction with the main line of railways. The output during 1892 was 117,611 tons, being an average of nearly 10,000 tons a month. The other collieries working during the year were the Lennoxton, the Newcastle, the Inkuzi, St. George's Cross, Southern Cross, Uithoek, and the Wallsend. At present no coal is imported into Natal, the colonial mines supplying all local requirements. Many of the vessels of the ocean liners, such as Messrs. King & Co., Messrs. Rennie & Co., the Clan line, and some of the mail boats and Her Majesty's warships visiting the port make use of this coal, and the whole of the Government railways are worked by it. The price of the Dundee coal at the port, alongside the ship, is 20s. per ton of 2,240 lbs. Shipping charges vary from 1s. 6d. to 2s. 6d. per ton, according to whether the coal is trimmed or otherwise.

Natal had the distinction of being the first in South Africa to introduce the iron-horse, a short line of railway having been made by a private company prior to 1860, to connect the town of Durban with the landing-place at the Point. But it was not until 1880 that railway communication from the Port to the Capital was completed, and branches laid down along the coast north and south of Durban. Surveys for further extensions were then made to carry the line to Ladismith and the neighbourhood of the coal formations. By the time the works were brought to that point, the remarkable development of the gold-fields of the South African Republic stimulated the enterprise and energy of the Colony to prosecute the railway system to the northern extremity of its border, at Charlestown, a distance of 304 miles, which was completed in 1891. The broken and diversified character of the country made the work a difficult engineering task. Only 47 miles of the main line are perfectly level; all the rest is a succession of dips and rises, and the gradients and curves are exceptionally severe—in some places the grade being 1 in 30; and the curves as sharp as 40 feet radius. At a distance of 58 miles from Durban, the line reaches a height of 3,054 feet above sea level, then falls 1,000 feet to Maritzburg, and rises again to 3,700 feet near Howick and the Umgeni Falls. Some idea of the

undulations which characterise the line may be formed from the fact, that each train starting from Durban, has actually to be pulled the equivalent to a lift of two and a half miles vertical, before it reaches the terminus at Charlestown, 5,386 feet above the level of the sea. At Laing's Nek, it passes through a tunnel 2,213 feet long. The scenery all along this main line of railway is most charming and interesting, from the singularly beautiful labyrinthine valley of the Inanda, outside of Durban, right up to the mountain peak of the historic Amajuba, on the Drakensberg, where a glorious panorama of Nature is unfolded. Another line has also been completed over a distance of 76 miles, from Ladismith over Van Reenen's Pass, an elevation of 5,500 feet above sea-level, to Harrismith, and a branch runs for a distance of seven miles from Biggarsberg to the Dundee coal-fields. The total mileage of railways at present opened and worked by the Natal Government is 399 miles. The amount which has been expended on railway works is £5,074,325, and the average cost per mile (without rolling stock) has been £11,317.



ZULU WAR MEMORIAL AT MARITZBURG.

CHAPTER XVII.

THE TEA INDUSTRY IN NATAL.

BY MR. W. R. HINDSON, NONOTI PEAK, NATAL.

TEA was first planted in Natal about the year 1850—almost half a century ago. This was in a small and experimental way. It would appear that the plants, then few in number, came from Kew Gardens, and were of what is known as the Assam hybrid variety. It was not, however, till about the year 1863 that any serious attempt was made to grow tea for consumption. At that time, some five or six planters took the matter up, and subsequently succeeded, on a small scale, in producing an article which found somewhat tardy sale in Natal and in the Free State; but tea planting was still looked at with a dubious eye, and was not gone into either vigorously or extensively. Early in the year 1877, the Lower Tugela Planters' Association imported a quantity of seed from India, and this was distributed amongst those members of the Association who were willing to contribute towards the cost of getting it.

Some 5,000 plants were obtained on the Kirkly Vale and Kearsney Estates, and from the seeds produced by these plants, originated the Tea Industry in its present magnitude.

At the present time there are about sixteen estates in the Nonoti District, with an aggregate of over 1,600 acres of tea planted, which estates depend almost entirely for revenue on returns from this industry; the two largest holders being Messrs. W. R. Hindson and Co., Limited, and Mr. J. L. Hulett and Co., Limited. There are about 500 acres more on different estates, between the Nonoti and the southern boundary of the Colony, including the Barrow-Green Estate near the Umzinkulu. Altogether there are now about twenty-eight tea estates in Natal, and the output of marketable tea from them will probably exceed 500,000 lbs.

The soil on which the Natal Tea grows best is a darkish sandy loam, but it also grows well on chocolate and reddish loams of a somewhat stiffer texture.

The fields are planted out when suitably wet weather occurs,

between the beginning of September and the end of March; the plants being placed in lines, at a distance of four to five feet apart each way.

The picking and manufacturing season is from the beginning of September to the end of June. The whole of the work on these estates—cultivating, picking, and factory work—is done by coolies, who are brought from India, under contract of five years' service. The average cost of a male Indian adult is about 32s. per month; this includes rations, medicine, and medical attendance. Women and boys cost proportionately less. A gang of coolies, of which 33 per cent. consist of women and boys, will work from $2\frac{1}{2}$ to 3 acres of land per hand, including picking, and will pick on an average 32 lbs. to 35 lbs. of green leaf per day; it takes 4 lbs. of green leaf to make one pound of manufactured tea.

The tea-plant gives its maximum yield of 600 lbs. to 700 lbs. made tea per acre, when at about seven years of age; but should, under good management, pay expenses when it has been four years in the ground.

The preparation of the leaf into the commercial article is a somewhat slow and tedious process, requiring great skill, care, and watchfulness. When the leaf is brought into the factory from the plantations, it is spread out thinly on trays or shelves to wither, and in a temperature of from 90° to 95°, this process generally takes from 16 to 18 hours. The withered leaf is then collected, and put into rolling machines, driven either by steam or water-power. The object of the rolling is to break the juice cells in the leaf, and to give the leaf that twisted appearance which commends it to buyers. The rolling of the leaf generally takes about half an hour to accomplish. The "mash" or rolled leaf is then taken out of the roller, placed on tables, and there allowed to ferment. This process requires to be very carefully watched, as an error on the side of either under or over fermentation, would take away from the value of the tea. Only an experienced manager knows when the right point has been reached. The time required for proper fermentation depends upon the temperature of the factory. In a temperature of from 85° to 90°, the process takes about two hours. Fermentation must be instantly stopped when the right point has been reached, and this is done by the leaf being put into drying machines, and subjected to a heat of about 400 degrees.

The tea after passing through the drying machines, is then sorted—a machine for that purpose separating the different qualities.

It is not generally known that the different grades of quality,

designated in commerce as Golden Pekoe, Pekoe, Pekoe Souchong, and Souchong, are all grown on the same bush, and are picked and manufactured at the same time. The sieving or sorting machinery separates the different kinds, after the process of firing or drying has taken place.

After manufacture, the tea is put into air-tight bins, where it is allowed to remain for a period of four to six months, to mature.

The only two large Factories in the Colony at present, belong to Messrs. W. R. Hindson & Co., and Messrs. J. L. Hulett & Co. At both places, extensive machinery of the most modern type is used. The first named, however, having an immense advantage in being able to utilize an almost unlimited water-power.

The acreage of tea now planted in Natal, when in full bearing, should about supply the requirements of the whole of the tea-drinking population of South Africa. Imports from China and other parts will have to be displaced before the country will absorb the entire production. Probably long before then considerable quantities will have to be exported to the London market, where the success of Natal teas in the next two or three years will have to be proved.

CHAPTER XVIII.

THE SUGAR INDUSTRY IN NATAL.

BY DAVID DON.

THE conversion of raw material into a something to supply a want in a civilised community has generally its "day of small things." It was assuredly so, in the case of the production of sugar from the sugar-cane, in the Colony of Natal; and the primitive means employed in the first attempt might almost have been conceived by the rude aboriginal inhabitants of the country.

We owe to Mr. Holden, in his 'History of Natal' (London, 1855), an interesting account of this first attempt of the colonists to produce sugar. Byrne's immigrants, introduced between 1848 and 1851, had brought up the population to about 8,000, and it was then, with this new life infused into it, that the small settlement really began its efforts in the work of colonisation.

Writing in 1850, Mr. Holden says:—"Sugar is now beginning to attract attention, and it is thought it may be grown advantageously. One gentleman has planted several acres. . . . Two years ago (*i.e.*, in 1848) I purchased a few plants, which were brought to this place from the Isle of Bourbon. I planted them in two different situations; one failed, the other brought forth abundantly, producing canes six feet long and six inches in circumference, which, by proper care, might even have been much larger." Mr. Holden was thus, himself, one of the first to take personal interest in the culture of the plant; but the gentleman who had planted the "several acres" above referred to was a Mr. Morewood, and it was he who thus inaugurated the first Natal Sugar Estate, on the Compensation Flats, on the Umhlali, about thirty-five miles north of Durban.

Mr. Holden's dates are not very precise, but we gather that the Compensation Plantation was begun in 1849, and that Mr. Morewood's *first crop* was reaped in 1851; the implements employed in the manufacture being a pair of wooden rollers, hewn from an old mast, for crushing the canes, and an ordinary iron Kafir cooking-pot, of about three gallons capacity, for boiling the juice. Thus was obtained the first sample of indigenous sugar in Natal.

It is noteworthy that Mr. Morewood, in workman-like fashion, began cultivating his land *with the plough*. In after years this was, to a great extent, discarded by Natal planters, partly, no doubt, because newly-cleared good bush land did not require it, and could be holed and planted at once, and probably more than once, with success. Five-and-twenty years later, when lands on many estates were becoming exhausted, and more than ever requiring treatment with the plough, the less experienced of them were disposed, notwithstanding, to fall in easily with the ideas of Mauritius brethren, then arriving in the Colony, and who, unaccustomed to the implement, looked askance at its utility. Now, however, ploughing is recognised by *all* as an essential operation on every well-cultivated property, unless when virgin bush land is being cropped.

As at many other localities much belauded at first, but selected without judgment, and necessarily without experience, sugar planting at Compensation did not fulfil its promise. Some years later it was written of the district that its then diminished cultivation was attributable to *the poor character of the soil*, though partly also to absentee proprietorship.*

In these first years, after the experiment at Compensation, the industry made very little headway. The slow growth of the cane-plant, requiring, as it generally does, two years to mature in Natal, would itself tend to limit the number of adventurers in sugar; and colonists disposed to embark in the enterprise were mostly, if not one and all, equally ignorant of the country they had settled in as of the requirements of the enterprise itself. Before capital, of which they had themselves but little, would answer to their calls, therefore, proof had to be forthcoming of some sort regarding many points beyond the mere fact that certain lands produced, or were proved capable of producing such and such a quantity of sugar per acre. Initial mistakes and mis-directed energy were only what was to be expected. First ideas had to be abandoned, or modified by experience. It was at first thought, for example, that the cane would only grow on flats. Experience taught that the soil on these was often poor, as at Compensation, and exposed the cane-fields to the serious risk of *fire*, owing to periodical grass burnings prevalent in the country. When they betook themselves to alluvial flats, chiefly on the banks of rivers, they found *frost* would sometimes blight their cane-fields, and *floods* would wreck mills as well as crops. These three F's—*fire*, *frost*, and *flood*—caused, and from time to time have caused, much loss to inexperienced or heedless planters.

* 'Notes on Natal.' Robinson. P. 53.

One of the pioneer estates, that at Springfield, on the banks of the Umgeni, a few miles from Durban, was almost totally destroyed by the great flood of 1856. The Umgeni rose twenty-eight feet, and not only submerged the Springfield cane-fields, but rushed through the factory to a depth of nine feet, and, among other havoc, carried the heavy battery of boiling pans clean out of the masonry. An amusing incident of this disaster occurred at the height of the flood, when a large elephant was swept past the mill, vainly struggling with the stream, and trumpeting furiously. On the same occasion another sugar mill was similarly destroyed on the banks of the Umhloti.*

The earlier mills were worked and continued to be worked by animal power (oxen); but about 1856 the steam-engine was introduced, and of course rapidly superseded primitive methods. The late lamented Mr. Tom Milner, of Redcliffe Estate, always ambitious to maintain an honourable lead, was the first to import steam-driven machinery, and in doing so, it appears, he had in view the making his factory a *central* one, and getting a number of small planters to supply cane.

According to Dr. Mann's work, 'The Colony of Natal,' published in 1859, there were then (or probably rather in 1858) twelve sugar mills in Durban County, chiefly on Isipingo flats, or on the Umgeni, close to Durban, and 1,490 acres under cane. In Victoria County, there were four or five mills only, but a larger proportionate acreage under cultivation. Other plantations, and one or two mills, had also started in less accessible districts, near the mouth of the Umkomas, and at Umzinto.

The following years were historically important in connection with a difficulty which the early planters were not long in experiencing, and which has from time to time recurred—viz., the supply of labour.

Thousands of capable and tractable enough aborigines existed in and around the Colony, but they could *only* be got to work by fits and starts, or as necessity moved them, on the plantation or the farm. This simply meant that the new industry, particularly, must needs languish and die if it had to depend on native labour. Hence, having the general interest of the Colony to consider, Government at length gave its sanction for the importation of Indian labourers; regulations were settled under Law No. 14 of 1859, and coolies were first introduced into Natal in 1860. Up to 1866, altogether 5,600 immigrants (including women) were thus added to the labour supply of the Colony; but in that year

* These incidents are recorded in *The Natal Journal*, Vol. II., No. 8, October, 1858, pp. 172-3.

considerations—chiefly financial—compelled a stoppage of the supply, and it was not again resumed till 1874, since which it has continued.

This is not the place to discuss the pros and cons of the policy of coolie immigration. Its expediency was demonstrated in 1859 and 1873, as it still is, by the absence of any practical endeavour, on the part of the Government, to utilise native labour. But it will be *apropos* of our subject to quote the following terse remarks by the late Mr. J. R. Saunders, of Tongaat, one of the most competent to speak on the subject, and recorded in the Report of the Indian Immigrants Commission, 1885–1887, of which he was a member—viz. :—

“The question resolves itself into this—can the Colony afford to put a check on production, and what effect would this have on the revenue, or progress, and the employment of Colonists? I view it as affecting Colonial industries and their development in the broadest sense, as a question affecting the progress of the Colony, its revenues, public benefit, and comfort, and, above all, as being the most practical way yet suggested in which *white Colonists* may secure profitable occupation in a Colony situated like ours. If we look back to 1859, we shall find that the assured promise of Indian labour resulted in an immediate rise of revenue, which increased fourfold within a few years, mechanics found their wages more than doubled, and progress gave encouragement to every one from the Berg to the sea. A few years later, well-founded alarm arose that it would be suspended. Simultaneously, down went revenue and wages, immigration was checked, confidence vanished, and retrenchment was the main thing thought of. Some years later—in 1873—a fresh promise of renewed Indian immigration created its effect, and up again went the revenue, wages, and salaries, and retrenchment was soon spoken of as a thing of the past.” (Report, pp. 98, 99.)

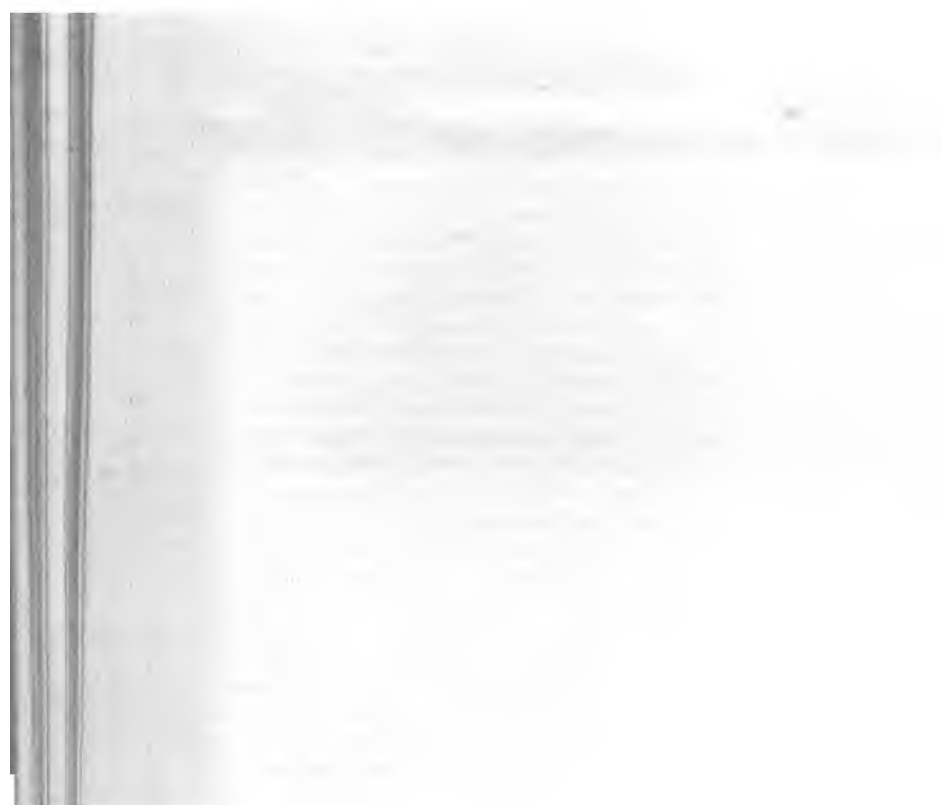
When this labour question first came to the front, and was settled as above stated, it occurred to some philanthropic minds that, notwithstanding the aboriginal Kafirs were apparently incapable, by inborn habits and proclivities, of utilisation as reliable labourers on other people's sugar estates, experiment should be made to ascertain how far they might be capable of industrial labour on their own account, *in that same industry*, and thereby possibly of fostering the love of labour, for its fruit's sake, among their fellows. Accordingly two sugar mills, for native use and purposes came to be successively erected.

The first was put up at Umvoti, about 1862–3, the idea being attributed to Sir George Grey, who visited the Colony in 1855, and again (with the then Prince Alfred) in 1860. Government



COOLIES CUTTING THE SUGAR CANE

[To face page 380.]



met the cost out of Native Reserve Funds; but alleged original bad planning of the mill, and other difficulties, incidental to experiments, prevented even moderate success until after ten years. It was under a European's control from 1865; and in 1872, the mill turned out 150 tons of sugar, and 300 acres were under cultivation by forty-seven native planters, these contributing cane equivalent to from one hundredweight up to ten tons of sugar, and receiving half thereof as their share, the mill getting the other half, besides the treacle. Whatever else has to be said upon the matter, the object of the undertaking has certainly not been achieved. Perhaps it might have been otherwise, had native policy been under the continuous direction of a statesman of Sir George Grey's calibre. The factory still exists, however, making about 150 tons a year, but is understood to be practically in the hands of two or three natives, who pay Government the handsome rent of *one shilling* per annum, and farm the concern as best they can, getting cane from *any growers* as grist to their mill.

The other experiment was of a different sort, and, if less successful and shorter lived than the Government subsidized one, deserved perhaps a better fate. It was a result of missionary effort. A report, appearing in the *Grahamstown Journal* of July 21, 1865, on the American Mission at Amanzimtote, says, "The station is remarkable as having now in full operation within its precincts the first steam sugar mill owned by natives, and entirely managed by native hands. This mill belongs to the natives Nembala and Ncaijana; and has been purchased and erected by them upon their own responsibility, at a cost of £700. The mill will manufacture *seven* tons of sugar this season, and has power adequate to the production of twelve cwt. per day. Nembala had only three days' instruction from an engineer in the management of his machinery, and now works the mill entirely himself. All the knowledge he has otherwise, he has gathered by visiting the largest mill in the neighbourhood." *

The early career of this Amanzimtote establishment seems to have been characterised by some ambition, for, at the Paris Exhibition of 1867, its name appears, among several other Natal sugar producers (Messrs. Wirsing and Reynolds, of Canonbie Estate, and Mr. W. Campbell, of Muckle Neuk), as a competitor for distinction. In 1872 it was still in existence (according to Robinson's 'Notes on Natal,' pp. 97 and 139), but must very soon afterwards have succumbed, for it has long since ceased to be heard of.

* *Vide* Holden's 'Past and Future of the Kafir Races,' (1866), p. 495.

Inherent causes are undoubtedly at the root of these two failures to train Kafirs, in numbers, and as examples to others, in industrial pursuits, requiring continuity of effort. Philanthropic work in that direction, *per se*, must ever be futile; and the sooner it is recognised, as the plain teaching of experience, as well as the intentions of Providence, that the typical Kafir has no natural inclination or ambition beyond being a "hewer of wood and drawer of water" for himself or others (with undoubtedly added capacity to act as soldier or policeman to his protectors), the better will it be for all concerned, and the easier will be the solution of the native question. But the Government official, or private politician, who will devise, and get put in operation, a practical and practicable scheme, by which native labour can, and will be, effectively and extensively utilised in the industries of the Colony, has yet to come to the front.

The labour question, however, was not the only, nor perhaps the most serious, embarrassment of the struggling sugar planters in the earlier years of the period under notice. The Colony generally then passed through a very severe financial crisis, brought about by land speculation and bad seasons. Under it a number of them succumbed; but the survivors gradually made progress, as well as improvement, in their work. The output of the mills in 1864 was three or four times that of any previous year. In 1867, under Law 1, the industry was protected by an import duty of 3s. 6d. per cwt., which has since remained in force. In 1868 rum became an item of export, Mr. Thomas Reynolds being among the first, if not the first, to recognise the distillery as a necessary complement of the sugar factory for utilising waste products. The Census, taken at the end of 1869, gave the following returns:—Land under cane, 15,892 acres; cane reaped, 5,757 acres (besides 164 acres by natives, at Umvoti and Amanzimtote); sugar produced, 7,823 tons; rum distilled, 34,778 gallons.

In 1870-71 a welcome impetus was given to the industry by the great discovery of diamonds in Griqualand West; and the determination of growers at this time to improve their product may be judged by the fact that, whilst in 1870 only three factories possessed a vacuum pan (a *sine quâ non* in the production of good sugar), the number was increased to twelve in 1873.

In the fifteen or sixteen years which have since passed, much progress has been effected in the development of the industry; and it would be surprising if it were not so, considering the great strides in material prosperity which have been going on simultaneously in South Africa generally.

Among the influences which have favoured its growth, railway

extension within the Colony deserves first mention. The line to Maritzburg was begun in 1876, and to-day its extensions to Charlestown, on the Transvaal frontier, and to Harrismith, *within* the Orange Free State, are accomplished facts. Extension beyond these points, and connection with the Cape, Free State, and Transvaal railway systems must quickly follow.

The completion of the North Coast line to Verulam in 1879 effected much for the planters in Victoria County; and, as much good land available for cultivation exists beyond that point, it is to be hoped the line will, ere long, be extended to the banks of the Tugela. The stoppage of the South Coast line at Isipingo, twelve miles from Durban, has been long a reasonable cause of



MOUNT EDGECOMBE SUGAR FACTORY.

grievance to producers in Alexandra and Alfred Counties, who are handicapped by their north coast competitors in the matter of transport; and no better land for sugar-growing is to be found in Natal than in some of these south coast districts, such as Illovo, Umzinto, &c.

The erection, in 1877-1878, of the well-known Natal Central Sugar Company's factory at Mount Edgecombe, under the able supervision of Mr. Alfred Dumat, from Mauritius, was a notable event; and it cannot be doubted that this undertaking, as well as the arrival, about that time, from Mauritius of a number of planters and artisans trained to factory work, did much to foster improved methods. The factory was furnished with appliances

entirely new in Natal, of the type in vogue in the best establishments in Mauritius; and its work soon proved that the product could be made, marketably as good, in the one Colony as in the other. It was first known as the "Usine Centrale," the original idea being to make it a central factory, solely for a *clientèle* of growers. Circumstances, however, of a special nature frustrated this; and although, from the first, a large number of planters have annually contributed their quota of cane for manufacture at the mill, as they still do, the Company have had to cultivate a large area on their own account. The factory can turn out about twenty tons of sugar per day (which is considerably more than the capacity of any other single sugar-house in the Colony), and its total output for last crop—1891-1892—exceeded 3,000 tons.

Among adverse influences affecting the industry of late years, the most important was necessarily the great fall in the market value of sugar, which took place all the world over, in 1883-4. Some thought its continuance would mean a permanent blow to Colonial sugar-growing; but, happily, although it caused one or two estates to go out of cultivation in Natal, and although the fall must be considered established, producers have put their shoulders to the wheels of economy and improvement, and a buoyant feeling as to the future still prevails.

According to Mr. Giffen's Report to the Board of Trade, in May, 1889, on the *Progress of the Sugar Trade*, the fall in the value of sugar in 1887, compared with the standard of prices in 1861, was 54·89 per cent. on refined and 48·01 per cent. on raw sugar. In that period all commodities fell enormously, *e.g.*, tea 37·84 per cent., wheat 39·86 per cent., cotton 27·03 per cent., wool 35·96 per cent.; but the greater fall in sugar was doubtless rightly attributed to the greater development of production, more especially of European beet sugar.

The labour difficulty cropped up again in this period on several occasions, notably when railway construction was being pushed, and during the Zulu and Boer wars and subsequent disturbances in Zululand. In 1888, also, a strong local feeling having prevailed among a section of the community against Indian immigration, the planters took the matter up, and in July of that year, held a conference on the subject, proving to demonstration, by elaborate statistics and the recorded testimony of every important producer, that the importation of Coolie labour has been, and continued to be, the mainspring of the Colony's productive power; that the bare prospect of its stoppage would at once paralyse all enterprise, especially on the coast, and inflict irremediable damage, both directly and indirectly, to general

interests. Since then there has been a disposition to regard the question as settled, except in so far as modification of the system, agreeable to all concerned, may hereafter be found practicable and expedient. But year by year the difficulty of procuring native labour seems to extend, and the increasing indents for Coolies, by upcountry farmers and others, prove that the question is of general concern.

PRODUCTION TO DATE.

The statistics of export of sugar by sea, &c., from 1854 to 1891, inclusive, show what the sugar industry in Natal has alone produced, in money value, and so contributed to the spending power of the Colony.

The total export of sugar by sea during this period has been—

187,942 tons, of a declared value of . . .	£ 3,456,564
To this we add, after careful computation, as an estimate of the quantity consumed within the Colony, and exported overland to neighbouring States, <i>one third</i> more, viz.*—	
62,647 tons, at same average value . . .	1,152,188
	<hr/>
	4,608,752
32,294 cwt. of molasses, exported value . . .	6,154
1,057,175 gallons of rum, . . .	51,397
1,495,125 " " sold within the Colony	
at say 1s. gallon . . .	74,756
Plus Excise duty, at say 4s. 6d. per gallon paid on the rum sold within the Colony . . .	336,403
	<hr/>
Grand total . . .	5,077,462

The bulk of export by sea has, of course, been to Cape ports. Of late years a good few shipments have gone to Australia, and a few to India. Exports to London have been chiefly of "concrete" and low qualities for refining purposes. Since the fall of prices, "concrete" has ceased to be manufactured.

* No one who knows anything about the matter will dispute the extreme moderateness of this estimate. If we take the annual output for the last ten years at only 12,000 tons per annum = 120,000 tons, and deduct the quantity exported by sea = 66,299 tons, we get alone 53,701 tons of the estimated 62,647 tons.

PRESENT POSITION AND PROSPECTS.

There are no official statistics available, nor machinery for recording them, unfortunately, but the following particulars about the existing condition of things may be taken as at least approximately accurate:—

The aggregate area under crop, in various stages, and prepared or being prepared for crop, is about 26,000 acres. Of these, about half are reaped annually, a fourth (or less) is replanted, and a fourth (or more) is allowed to ratoon for one, two, or sometimes even more crops. The varieties of cane most in vogue are "Green Natal," "Lousier," and "Port Mackay." On one or two estates occasionally liable to frost a hardier sort, known as "Uba," has recently been introduced satisfactorily. The yield per acre varies much, according to soil, seasons, and care bestowed, but may be taken, one year with another, to average about $1\frac{1}{2}$ tons. Two or three tons is not uncommon on good land and in favourable seasons. Comparatively little imported manure is employed, planters preferring the more economical and, in their view, superior home-made production from cattle kraals and stables, factory and distillery refuse, &c. All estates having factories grow cane on their own account, with one recent exception, the owners of which have just leased their land, with the view of making their factory a purely "central" one. But there are many growers of cane—perhaps forty or fifty—who get their sugar manufactured on satisfactory terms at conveniently situated factories. One planter, who has no mill of his own, reaped canes last year which gave about 400 tons of sugar.

There are thirty-six factories now in working order, most of them with an output of from 200 to 500 tons per annum, about half-a-dozen having larger capacity. The aggregate output for crop 1891–1892 was about 18,000 tons, about a fifth being white crystals, and the remainder yellows and syrup sugars. That for 1892–1893 will probably be about the same, if the season continues favourable. Most of the larger factories have "double crushing"—*i.e.*, by a pair of mills, and nearly all have vacuum pans for juice and syrup boiling, but some only use "Wetzels" and "open batteries." Much of the machinery employed is admittedly out of date, but improvements are being gradually introduced. Electric lighting is being installed, or is about to be, at the more important establishments. The crushing season runs usually from June or July to January, the planting one from August to December. Though the number of factories has much diminished during the last fifteen or twenty years, cultivation has considerably increased.

There are now eleven licensed distilleries only. A few years ago there were more, but rum manufacture probably remains about the same—say 2,200 hogsheads per season, half of which finds its way to the London market, and half is sold or consumed in the Colony.

Labour.—As already indicated, the mainstay in the shape of labour are the Indian Coolies. According to the Protector of Immigrants, there are now 8,583 adult male Indians indentured in the Colony. Of these the sugar estate owners employ 4,632*; besides women and boys, say, 500; and free Coolies and Kafirs, estimated at 1,500; total, 6,632.

In 1888, by the returns got for the Planters' Conference, the proportion of indentured labour was much less, and that of free coolies and Kafirs greater. The latter classes, of late years, since the development of the gold fields and railway extensions, have become more migratory, and get higher wages at other employments. The coolie is indentured for five years, during which employers, in addition to the regulated scale of wages and rations given, contribute a variable amount (now £17 10s. per male adult) for expenses of introduction and return passage money. The cost of the coolie labourer, all included, averages about one shilling per day.

The capital employed in the industry was estimated by sugar growers themselves, in 1888, at £830,500. The successful flotation in England, last year, of the Umzinto and Esperanza Estates into a joint stock concern (Reynolds Brothers, Limited), with a capital of £100,000, was a noteworthy instance of outside confidence in the stability of the industry.

Successful sugar growing anywhere, of course, depends much on climate and rainfall. The climate of Natal, has upon the whole, proved favourable to the cultivation; but it is undeniable that the seasons fluctuate considerably; and that, during the last decade, several severe droughts have been experienced. Some attribute the diminished precipitation, proved by statistics for that period, and the irregularity of rainfall generally, to solar energy, indicated by sunspots, and producing "cyclical periods." (*Vide* "Cycles of Drought and Good Seasons in South Africa," by D. E. Hutchins, Wynberg, 1889.) In Mr. H. G. Fourcade's "Report on the Natal Forests," 1889, the subject of diminished rainfall in Victoria County (the chief field of sugar production) is discussed in an interesting manner, and illustrated by a diagram, which combines Mr. Hutchins' Cyclical periods, with "waves of rainfall," observed

* The remaining 3,951 are indentured to up-country farmers, the Natal Government Railways, tea and coffee growers, &c.

by Mr. Wilkinson, of Ottawa Estate, from 1870 to 1890. The diagram clearly shows a steadily diminishing quantity in these "waves," closely corresponding with the years of Mr. Hutchins' "Sunspot Minima." Mr. Wilkinson's statistics show that in the period 1871-8, the mean rainfall at Ottawa was 39 inches, whilst that for 1882-9, was only 30·8 inches, and a consequent excess of 26·6 per cent. in the former over the latter period. This being a greater variation than found at other points of observation in South Africa, Mr. Fourcade concludes that a local cause operated in Mr. Wilkinson's locality, viz., "the clearing, since 1860, of some 35,000 acres of forest for coffee and sugar planting." We are disposed to think there is a measure of truth in the deduction; and trust that in default of the Government doing its duty by encouraging tree planting on the coast, planters will do all they can themselves to cover again with trees a large portion of the lands they have cleared in bygone years for planting and fuel.

As is well known, it is only a coast belt, ranging from perhaps six to twelve miles inland, that contains the soil, and that is otherwise suitable for cane-growing in Natal. Admittedly a large portion of this is not suitable; but besides what is now successfully cultivated, there are various large tracts of superior land to be found. Indeed from the Tugela to the Umzimkulu, land is, or could be made, available to grow all the sugar South Africa is likely to consume for many years to come. Unfortunately some of the best for the purpose has been long under a sort of Chancery bondage, as native or mission reserves, and it is high time steps were taken by the Government to bring about the utilisation of such lands for the increase of production of the Colony. Among other promising localities mention may be made of the Lower Umzimkulu, where, in addition to excellent field for cultivation, water-way facilities would be invaluable.

THE PROSPECTS OF THE SUGAR INDUSTRY.

These may be considered very satisfactory and hopeful. All those now engaged in the enterprise have had many years' experience of its ups and downs. They know what to expect in the way of seasons, and better than most of their predecessors the *prime necessity* of more careful culture of the raw material, proper selection of land and plants, ploughing, manuring and labour-saving appliances, tramway transport, &c. Factory work is also much better understood than formerly, and there is less of guess-work all round than there used to be, and more practical study of the elements of success. The fall of prices, which at one time

threatened ruin, has in Natal, as elsewhere, given an impetus to exertion and improved methods.

One of the greatest advantages which the Natal planter now possesses over almost every other cane-growing country, but which he has hardly yet learned to appreciate, is the realised possibility of a cheap fuel-supply in *Colonial coal*. For the present, doubtless, its use will be limited by the railway facilities planters may have. But it should be possible, on many estates, now to burn coal in their boiler furnaces in place of the timber ruthlessly cut down in past years, and of the cane straw, or trash, and the megass from the crushing rollers, which may now, as ought to be, returned to the soil as manure constituents.

A cheap coal supply, moreover, is of special benefit, and a first necessity to such growers as may contemplate embarking in what many believe to be the true and *only scientific method of cane-juice extraction*, viz., by the *diffusion process*; this being simply the dissolving out, of juice from the cane, by means of hot water, it entails a subsequent evaporation of a large quantity of water, and consequent expenditure of fuel; and it is inapplicable where fuel is dear. Roughly, there is theoretically 90 per cent. of juice in the sugar cane. Of this, few mills extract more than 70 per cent.; and in Natal the extraction may range from 50 to nearly 70, what is *not* extracted being simply so much waste. To use another formula: there is 12 to 13 lbs. of sugar in 100 lbs. of well-grown canes; of this, crushing mills express only 5 to 8 lbs. of sugar, according to the condition of the canes, and the power of the mills. It stands to reason, that, if the canes are dry, as they are sometimes liable to be in Natal, though not necessarily wanting in saccharine matter, the extraction of juice by rollers is minimised, and probably half the sugar they contain is left in the megass. By diffusion, on the other hand, nothing, or practically nothing is lost; and the drier the season and the canes may be, the better will the juice extraction be as compared with the existing mode of extraction.

It has been by the adoption of scientific methods, in both the departments of agriculture and of manufacture, that the beet sugar industry in Europe has made such enormous strides of late years, and threatened the existence of cane-growing in the Colonies and elsewhere; and it is by the adoption of similar methods, wherever practicable, that the cane-grower will be able in the future to succeed.

With the moderate protection the industry has in Natal, 3s. 6d. per cwt., and the increasing consumption of sugar in South Africa, there seems no reason why the production of to-day should not be doubled or trebled in the course of the next ten years;

but it is to the South African market chiefly, if not alone, that growers should look if the Colony is to increase its production. The competition in the manufacture of both beet and cane sugar outside our little sphere is so great, that it would be unwise to advocate extension of cultivation for the purpose of export to other countries.

No greater stimulus could be given to the development of the sugar, tea, and other like industries in Natal, than the attainment of a Customs' Union, and free exchange of indigenous products between the several colonies and states of South Africa. To all appearances, this desirable object is not very far off. Politicians and the press are unanimous that it ought to be attained; and, doubtless, present difficulties will vanish when each colony and state looks a little less intently to its own particular interests being secured in this important matter.

NOTE.—Those desirous of further information as to the present conditions and prospects of sugar culture in Natal, may with advantage peruse articles on the subject in 'The Sugar Cane Magazine' for January, February, and June, 1892.

CHAPTER XIX.

NATIVE RACES AND NATIVE TERRITORIES.

THE earliest knowledge of South Africa disclosed two races occupying the territories adjoining the Cape of Good Hope. The one was a yellowish-skinned people with crisp, tufty hair, projecting cheekbones, flat noses, and a tendency to fatty and other integumentary out-growths. They led a nomadic life of pastoral ease, seemingly comparatively rich and happy upon the abundant produce of their flocks and herds. These were the Hottentots who impressed the Portuguese navigators as being "a pleasure-loving race, given to music and dancing, which seemed good after its fashion;" and Camoens, in his national epic, the "Lusiad," thus pictured their rural joys:—

The tenants of the coast, a festive band,
With dances meet us on the yellow sand;
Their brides on slow-pac'd oxen rode behind;
The spreading horns with flow'ry garlands twin'd,
Bespoke the dew-lapp'd beeves their proudest boast,
Of all their bestial store they valued most.

By turns the husbands, and the brides prolong
The various measures of the rural song.
Now to the dance the rustic reeds resound;
The dancer's heels, light quivering, beat the ground;
And now, the lambs around them bleating stray,
Feed from their hands, or round them frisking play.

Methought I saw the sylvan reign of Pan,
And heard the music of the Mantuan swan:
With smiles we hail them, and with joy behold
The blissful manners of the age of gold.

The other race appeared to be of a lower order, although the leading features of the Hottentot physical conformation might be traced in them. They were of more diminutive stature, and spare, emaciated figure. They lived in small families in the rocky mountain glens and desert wastes, hunting or trapping wild game, but never cultivated the ground, nor bred any animal. When the chase failed them, they satisfied the cravings of their appetites with the bulbs and roots of the earth, the larvæ of ants, honey, gum, locusts, and various other insects and reptiles. The bow and arrow were their only weapons—the latter made of reed, tipped with a piece of bone or stone flake, and steeped in a deadly

poison. The Hottentots looked upon them as the type of all that was savage and treacherous, and feared them, whilst the early Europeans deemed them a wild species of humanity, and termed them the Bushmen.

The investigations of ethnographers and philologists go to show that these two races were the primeval inhabitants of a great portion of the continent of Africa; that they sprang from one source, and were "children of the same mother," but at some remote period formed into two branches, and were separated from each other for thousands of years before the white man came in contact with them.

In their outward aspects, in many of their customs, and in their mythologies, there is *prima facie* evidence of a common origin. Even their language is somewhat akin. The structure of the Hottentot, or "Khoi-Khim," of which there are several dialects, has been found to be beautiful and regular, and translations of the Gospels, as well as a large amount of missionary literature, have been published in it. The late Dr. Bleek, described it as monosyllabic, of the suffix-pronominal order, and exhibiting, in the most primitive form known, the features of those highly cultivated languages distinguished by sex-denoting qualities common to Northern Africa, Europe, and part of Asia. It is interspersed, however, with uncouth "clicks"—sounds produced by applying the tongue to the teeth, or to various parts of the gums or roof of the mouth, and suddenly jerking it back. Three-fourths of the syllabic elements of the language begin with these clicks, and combined with them, are several hard and deep gutturals and nasal accompaniments. The difficulty for a European acquiring an accurate pronunciation is not so much in producing the clicking sound singly, as in following it immediately with another letter or syllable. The Bushmen, as well as the Hottentots, have these "clicks," but in the number of their varieties, and in the range of organs employed in their pronunciation, they far exceed those of the Hottentot language. Other points of dissimilarity have been met with, but, as Dr. Bleek has observed, these do not exclude the possibility that, like English and Latin, the Hottentot and Bushmen languages may originally have been derived from a common primeval stock.

Both of these primitive peoples appear now to be rapidly decreasing in numbers, and probably in the next century will gradually die out. Dr. Fritsch, in his admirable work on the Ethnology of the natives of South Africa, estimated the number of the Hottentots in the days of Van Riebeeck at 150,000. At the census of 1875, in the Cape Colony, as many as 68,717 persons were recorded as members of families living together, belonging

to the Hottentot race, but a large number of those so returned were admitted to be of mixed origin. To guard against a similar error at the census of 1891, instructions were given to the enumerators to note that, as comparatively few pure-bred individuals of the race were extant, no persons should be classed as Hottentots where the distinctive characteristics of the race did not predominate. The result was that in 1891 the total in the whole Colony was returned as 50,388, and of these 5,296 were classified as Bushmen. North of the Orange River, in Great Namaqualand, where the pure-bred Hottentot tribes are still to be found, the total population in 1877, was estimated by Dr. T. Hahn, at 16,850; and, according to the same authority, at the present time (1893) they do not number at the utmost more than 12,000. At the commencement of the century they were probably as many as 50,000; but the frequent Damara wars, as well as their own inter-tribal fighting, together with contagious diseases and brandy, have reduced, and threaten finally to exterminate them completely.

Remnants of the hunting Bushmen are also to be met with. These are the aboriginal type of the Abatwa pigmy race of Central Africa. At one time widely spread over the continent, they have been displaced by their own kinsmen, the Hottentots, and the superior Bantu invaders; but throughout the country from the Cape to the Zambesi, they have left their crudely-artistic drawings and their prehistoric stone implements on rocky hills and in sheltering caves to mark their former habitats. These drawings consist of representations of a mythological character, relating to their customs and



TITUS, A CAPE BUSHMAN.

superstitions, or of animals and the human figure, coloured in clay and ochre. In some parts, as in Bechuanaland, the drawings are

cut into flat surface of rocks, with rough stippling of birds and animals, and ornamental figures in oval-shaped and concentric patterns. Half a century ago, a number of the Bushmen tribe occupied the rugged portions of the Drakensberg and Maluti mountains, hunting game and occasionally making raids on their European neighbours. They were also pretty numerous along the banks of the Orange River, skirting the northern districts of the Cape Colony known as Bushmanland. Now they have entirely disappeared from the Drakensberg and Maluti, and there are very few left on the Northern Border. These few are scattered over the country in small bodies. They go about almost naked, spend



THE BUSHMAN ARMED.

their time in hunting game, searching for roots, and in sleeping. They do not build even the rudest hut, and are content with putting a few bushes together as a shelter from the wind. In spite of the hardships they undergo, they are a merry, light-hearted people. Some members of a family will work for a time, and on the goats thus earned the rest will live, using the milk as long as game can be got, but slaughtering the milk-giver if game fails. They do not systematically prey on the farmer's flocks and

herds, as Kafirs do; but when hunger drives them they do not scruple to take a horse, mule, a goat, or sheep to satisfy their wants. They think no more of killing a human being than of killing a buck. One of the farmers in the locality, a few years ago, came upon two Bushmen unexpectedly in the veldt, and before he could take his rifle out of the sling, or get under cover, he was shot with an arrow, which pierced through a thick jacket and trousers, with fatal effect. Outrages of this nature led in past years to armed parties being formed to clear the country of them, and when collisions occurred, numbers were ruthlessly shot down with as little consideration as if they were wild animals.

In Great Namaqualand and the Kalihari, the Bushman population number two or three thousand, and in the north-east of Damaraland there are small wandering tribes of them, including the Ai-San, the Kun-San, the Au-ai-san, the An-San, the Matsana-Khoi-San, and the Bushmen of Otave, who are remnants of the old paramount tribe of Great Namaqualand, the Gei-nams, broken up by wars at the beginning of the century, and now leading a Bushman life.

Besides these primitive races, inhabiting South Africa, there were the dark-skinned negroids of the Bantu stock, speaking a euphonious polysyllabic, prefix-pronominal language; living under hereditary chiefs; pastoral and agricultural in their pursuits, dwellers in villages, and workers in metals. They are now known as the tribal groups, classed as Kafirs, Zulus, Makalakas, Bechuanas, and Damaras, all having ancient traditions of invasions, wars and forays, during their migrations southward and eastward from their long-forgotten home in the north and east.

The term "Kafir" signifying infidel, was applied by the Mahomedan Arabs to all the dark races of Africa, and it was adopted by the first Europeans who came in contact with the tribes on the eastern border of the Cape Colony. The national designation of these tribes was the "Ama-Khosa," or sons of "Xosa," the great chief from whom they claim unbroken descent through twelve or thirteen generations. They again are subdivided into Ama-Gcalekas or Gcalekas; the Ama-Gqaika or Gaikas; the Ama-Dhlambi or T'Slambies; the Aba-Tembu or Tambookie Kafirs, and other minor tribes. They first crossed the Kei River and invaded the country of the Hottentots about 1650, almost contemporaneous with the appearance of the early European settlers in Table Bay.

The Kafirs are physically superior to the Hottentot race. They are generally fine, powerful, able-bodied men, reserved and self-possessed in manner, but courteous and polite, and sensible of kindness and consideration. Their form of government was a well organised although simple one. They had a regular gradation of authority from the head of the family, who was responsible for its conduct, or the head of the kraal or village, who was responsible for the collective families therein, up to the chief, who, with his councillors, adjudicated in all matters relating to the affairs of individuals, or of the tribe. They had a system of law which took cognisance of crimes and offences, enforced civil rights and obligations, provided for the validity of polygamic marriages, and secured succession to property according to well-defined rules. Superstition entered into all the affairs of their life, and formed part of their laws, customs and religion. They believed in

benevolent and evil spirits producing prosperity or adversity in health or sickness, and witchcraft was recognised as one of the evil arts practised with the view of causing death or injury to property. The alleged offender, charged with being *umtakati* (wizard or witch) was stripped of his possessions, and after being subjected to various kinds of torture, was frequently put to death. The procedure supplied a convenient method of getting rid of any obnoxious person, or one whose property was coveted.

They had many good traits in their character. Their bravery and devotion to their hereditary chiefs was well illustrated by an



LINDINKOWA, ONE OF THE AMA-KHOSA.

incident which occurred during the year 1818, when a great inter-tribal battle was fought on the Debe Nek, in the district of King William's Town, between the chief Gaika and his uncle T'Slambie, who had acted as regent during his nephew's minority. The quarrel was provoked by Gaika's own doings. He had carried off one of his uncle's young wives, and another dusky lady, who was the wife of one of the chief councillors. These sages spoke and remonstrated with their young chief; but to no avail. Gaika turned a deaf ear to all their counsel, calling them traitors to their lawful chief. Preparations were then made on both sides for a conflict; and a bloody, and in many cases hand-to-hand

combat ensued, which ended in the defeat of Gaika: but not before almost all his men of note had fallen. On the day preceding the battle, many of the councillors who had been called traitors set their affairs in order, and took a final farewell of their friends and families, telling them they did not intend to return, but would show on the morrow that, though they had opposed their chief in his evil ways, they were not afraid to die in his cause. And they were faithful to their resolution. Occupying the foremost ranks in the fight, where their position as councillors did not require them to be, they were singled out by their opponents, and were the first to fall. Not one of them returned.

In all wars with the Colony, it was noticeable that they scrupulously respected women and children, and that their missionaries were protected, or assisted to a place of safety, and rarely injured by those amongst whom they laboured. It is said that in their language they have no phrase or word equivalent to gratitude, yet in many instances they have shown that they possess the quality. Kafir servants have warned their masters of impending danger when they might have taken their lives and stock; and in numbers of cases individual members of the tribes, who experienced kindness from officials and traders, have assisted in rescuing and saving them on the outbreak of hostilities.

Christian missionaries first settled in what was then known as Kafirland only seventy-five years ago. These were the Rev. Messrs. Williams, Brownlee, Thomson, and Bennie. Soon afterwards their numbers were strengthened by Messrs. Ross, Shaw, Shepstone, Weir, Chalmers, and McDiarmid. They had to acquire the language, and adapt the alphabet to the Kafir tongue, before they could influence the people by their teaching. In those days no article of European manufacture was seen other than beads, brass wire, or buttons, which were the medium of currency. The chiefs wore robes of leopard-skin, and the women cloaks of ox-hide. The tribesmen were adorned with red clay, and never went any distance from their homes without being armed with assegais. Numbers of them, both men and women all in full barbaric dress, their bodies and karosses painted with red clay, would sometimes attend the church. When asked where they were going, they indicated that they were "going to the dance," and in church they showed that they had but a vague idea of the nature of the service. They soon slipped off the forms on which they were seated, and squatted on the floor, took out their pipes, and commenced smoking. Notwithstanding many discouragements and difficulties, the missionary influence gradually brought about a change. Natives abandoned the old superstitions, and broke through the national customs, adopting

the teachings of Christianity and the forms of civilised life. The wooden spade, which was their only agricultural implement, gave way to the ploughshare, and the red clay to European clothing; and in proportion to the extension of educating and industrial agencies, there was evidenced a greater readiness to work and labour, in order to supply and satisfy their increasing wants.

Neither Christianity nor civilisation has as yet, however, taken entire hold of the population. The large majority of them have no religion whatever, and are wedded to the barbaric customs and superstitions of their forefathers. But, considering the comparatively short period in which enlightening and educating agencies have had time to operate upon them, considerable advances in the process of raising and elevating them have been made. Many thousands have renounced heathenism, with all its superstitions, and enrolled themselves as members of religious bodies; and they can proudly point to churches and chapels which have arisen chiefly from their own efforts, where large native congregations, neatly dressed and well behaved, regularly assemble at the sound of the Sabbath-bell. Some of them, thanks to the training they have received at mission stations, have become fairly skilful artisans and tradesmen. A number have qualified themselves to be preachers and teachers among their fellow-countrymen. Others have become purchasers of property, or are in possession of leased lands. They are owners of cattle, horses and woolled sheep, and producers of grain and other products; while a very considerable portion periodically engage in manual labour in the diamond, the gold, and the coal mines, in the railway and other public works, on the farms, and sometimes in the households, and together with the Mixed Races furnish the rough labour power of the Colony.

The Mixed Races are descendants of various peoples transplanted to the Cape within the last two hundred years from Java, Ceylon, Madagascar, and Mozambique, and who, intermingling with each other, and with the indigenous stock, have produced a heterogeneous and motley population of every gradation of colour, feature, and physique. These are a numerous, and, upon the whole, a well-behaved class, very serviceable, not only in all agricultural operations, but in various domestic and industrial employments.

The Kafir tribes within the boundaries of the Cape Colony, number about 600,000 persons. They occupy locations or allotments in different parts of the eastern border districts, such as Uitenhage, Alexandria, Albany, Fort Beaufort, East London and King William's Town; but the bulk of them are in the territories between the Great Kei River and the borders of Natal, forming

the divisions of the Transkei, Tembuland, and Griqualand East. Some occupy lands under individual tenure, and it is noticeable, that they are far in advance of those who are under the tribal or location system. This is shown in the better description of houses and huts they dwell in, the style in which they are furnished, the constant use of European clothing, the better education of their children, and in the production of a much wider range of agricultural produce. The "red," or heathen native (by which term those who live in tribal locations are more commonly known), are still subject to the conservative influences of their race, retaining their polygamous customs, venerating the spirits of their ancestors and believing in the demons of sorcery and witchcraft.

These tribes have all, with the exception of a section of the



CAPE BOYS—THE MIXED RACES.

Pondos, accepted the supremacy of the Cape Government; and most of them have voluntarily given in their submission from an appreciation of the advantages of British rule and protection. They are under the supervision and control of two Chief and several subordinate European magistrates, who are centrally placed amongst them, carrying out the native policy initiated by Sir George Grey. These officers administer a special code of criminal law, embodying the general principles of the existing colonial law, but retaining some provisions of native law commending themselves as applicable, such as that dealing with the communal responsibility of kraals or villages in respect of stolen stock where "spoor" may be traced to them. The native witch-doctor, however, is suppressed by all imputations of pretended

witchcraft being made a punishable offence. To the administrative ability, personal influence and good guidance of these magistrates, in the management of the communities under their charge, may be greatly ascribed the present prosperity of the natives, and their contentment with our protecting rule. Their work of gradually revolutionising the conditions of native society, is supplemented by the many mission and industrial schools established in the country by the Christian churches, and which are aided by grants from the public revenue.



LOVEDALE MISSIONARY INDUSTRIAL INSTITUTION.

CHAPTER XX.

PONDOLAND.

THE Ama-Pondos, who occupy the beautiful coast country from the Umtata River to the Umtamyuna River, between the Cape Colony and Natal, are still an independent tribe. During the reign of the Zulu king Chaka, they were conquered and dispossessed of their cattle, and with some other lesser tribes found shelter in the broken wooded country about the St. John's River. On the emigration of the emigrant Boers to Natal, the Cape Government recognised the Pondo chief Faku as paramount over the territory, and entered into a friendly alliance with him. By this intervention they had the prestige of British protection, and consequent upon it their population and wealth soon increased. After Faku's death, he was succeeded by his son Umquikela, during whose lifetime there were continual disturbances with the different smaller tribes of the Pandomise, Bacas, and Xesibes; and, owing to these hostilities, the Colonial Government considered it advisable to extend its jurisdiction over Pondoland, but the Imperial authorities objected. It was considered advisable, however, to secure the port of St. John's River, and in 1878 Sir Bartle Frere concluded an agreement with Nqwiliso, the chief of Pondoland, who was recognised as entirely independent of Umquikela, for its purchase. Afterwards, as it was found that attempts were made to open ports on the coast of Eastern Pondoland, free of the control of the Colonial Government, through which guns and ammunition were being supplied to the natives, a proclamation was issued in 1885, declaring Her Majesty's protectorate over the whole coast. Subsequently complications arose from wars between the Pondos and Xesibes, and other minor tribes, as well as the claims of Umquikela for the revenue from the ports of St. John's River. These differences were settled by an agreement concluded in 1887 by Mr. W. E. Stanford, on behalf of the Secretary for Native Affairs, Sir J. A. de Wet, giving Umquikela and his heirs a subsidy of £200 per annum, and a sum of £1,600 in consideration of the cession of Xesibeland and the renunciation of all claims against the Colonial Government. Umquikela then undertook, on behalf of the

Pondos, to control the border of his territory, to suppress stock thefts, and maintain good order and friendly relations with the Government. After his death he was succeeded by his son Sigcau, who is now the ruler of Pondoland, which has an area of 3,869 square miles, and a population of 200,000 souls.

Within the territory the worst features of barbarism have yet their sway. Murder, rapine, cruelty, and injustice reign. "Smelling out," and sacrifice of life on charges of witchcraft are of continual occurrence. In Western Pondoland the remonstrances of the High Commissioner against the spilling of human blood has had some influence on Nqwiliso, who was given to understand that a continuance of it would imperil his independence. He has recently issued the order—"From to-day let there be [neither man, woman, nor child put to death for witchcraft"—and sounded the death-knell of this heathenish custom in his territory.

In Eastern Pondoland the belief in witchcraft and the utility of the witch-doctor to smell out those who practise it is unbounded, and receives countenance from the chief himself. An incident of by no means infrequent occurrence which was witnessed at his kraal, the "Umzi wa Kwomkulu," or Great Place, will illustrate this, and the cruel system which from time immemorial has exerted a peculiar fascination among these people.

The Great Place of Sigcau, the "Spider," is situated on a commanding ridge overlooking the Xura River towards the west, and the Umsikaba Valley to the east; while on the coast side, the country stretches away in easy undulations, a land of beauty and repose, suited to the lotus-eating Pondos. Groups of natives are lying idly about, chatting and smoking; while women and children are nearer the huts, enjoying themselves in the bright sunshine.

A weighty matter is evidently under discussion among the older councillors. Yesterday, the chief's stable was burnt down. It stood near the office, and some of the goods in the office were hurriedly removed lest the fire should extend to it. Among these goods was a horn, which contained the choicest of the charms and medicines necessary to the well-being of Sigcau and the Pondo nation. After the safety of the office was assured, the articles removed were replaced. But the precious horn could not be found. Careful search was made all over the kraal, without avail. In the morning, men were sent to the witch-doctor to inquire who was the incendiary and thief. With the party was Bateji. The doctor, after due preparation, went through his incantations and his wild witch-finder's dance. The women stood around clapping their hands in time with the dancing and chanting with weird impressive effect, whilst the doctor rapidly related the occur-

rences of the day and traced the malice, which desired ill to the chief and the Pondo people. The men from the Great Place sat together before him listening. Only the lurid light in their eyes expressed how their savage superstitious feelings were aroused. "A snake had been sent by its owner to take the horn," the doctor said—"a big snake. The owner called it from the Umsikaba."

"Who is the owner of that snake?" one of the men asked.

"Bateji," was the reply; "the snake belonged to him."

In vain was Bateji's denial. Significantly his fellows moved away from his side. They would not sit by the polluted man. He might perhaps have made good an escape at this time; but, conscious of innocence, he did not attempt it. So they all returned to the Great Place, and a report was fully made to the chief. Bateji was secured, declaring the witch-doctor's accusations false.

Next morning he sits alone, and apparently unwatched. But scores of eyes are upon him, nevertheless. He has been examined and cross-examined again and again, to induce him to confess the misdeeds, and produce the fatal horn. At last he determines to make a run for life, dear life. He is off and away. A shout, and the hell-hounds are after him in full cry. A powerful man and a fast runner, it seems at first that he will reach the cover of a forest about two miles away; but the pack proves too strong for him, and struggling and panting he is captured and brought back to his doom. Then the questioners are at him once more. "Why do you run away, if you are innocent?" "Has not the doctor said you are the 'gqwira' (wizard)?"

They have him alone, as some horsemen are seen approaching at a rapid pace. Foremost is a fine-looking young man, riding a fiery black horse. It is Sigcau. He gallops up; then reining his horse suddenly in, he sits for a few minutes motionless in the saddle. All the men throw up the right hand and shout "Longilanga!" Bateji shouts too. The women make no sign of recognition. Then Sigcau dismounts, and his horse is led away. A few words with the leading councillors, and he repairs with them to the office to deal with Bateji's case. The councillors said he was obdurate; of his guilt none expressed a doubt.

Things are not done in a hurry at the Great Place. After a proper interval, a message was sent from the chief to Bateji, that unless he confessed and produced the horn, he should be put on the yoke. Bateji's reply was "I am innocent." Then he was tied to a yoke by his arms, with reims pulled as tight as could be. As the thongs cut into the flesh and prevented circulation, the pain was terrible, and Bateji writhed and yelled. Then his

tormentors urged him to confess. But he could not say where the horn was.

An hour and a half of this torture, and the inquiry had got no further. Sigcau sent another message. "Go and tell Bateji that unless he confess and produce the horn, I will hand him over to the young men." Bateji said, "Let the young men take me." Sigcau altered his mind. He asked the owner of a cart to drive him over to another kraal. They went, and Bateji had two more hours of his agony.

On Sigcau's return, he learnt that Bateji had not confessed. But the torture had done its work. He was hardly recognisable. Then Mapenduka was sent to a hut to fetch Bateji's own rifle and two cartridges. When these were brought, Nobulongwe was called. To Nobulongwe, Sigcau said, "Take that man down below the kraal and shoot him, then let his body be dragged to the other side of the river. Don't take him over the river first. Kill him here. I want to be sure that he is dead."

So Bateji was led about two hundred yards from the kraal, with the yoke still across his shoulders. Then they took the yoke off him, and tied his hands behind his back. He made no resistance.

"Shut your eyes. I am going to shoot you," Nobulongwe said.

"You shut yours," was the defiant reply; and as he lay on the hill-side calmly facing them, Nobulongwe put the rifle almost against the man's head and fired. The dust rose; there was a quiver, and a human life had fled. A reim was tied round the neck, and two young men dragged the body across the pretty Umsikaba river, and left it on the other side for the vultures and the crows.

As the shot was fired, a woman's voice rose piercingly at the kraal, in sorrowful lament for the death of Bateji. They tried to force her to be quiet, but she paid them no attention, and wailed pitifully. Then they drove her into one of the huts. That night she left the Great Place, and returned to her people in Xesibiland. So Bateji had one friend whose love stood true and faithful, even in that most dreaded disgrace to a Kafir,—the accusation of witchcraft.

CHAPTER XXI.

ZULULAND, AMATONGALAND AND SWAZILAND.

ZULULAND, formerly the home of the Zulu kings, was declared British territory in May, 1887. After the conflicts between the adherents of Cetuywayo and Usibepu, which resulted in the cession of over 4,200 square miles of the country to the Boers, and the formation of the New Republic (subsequently merged in the South African Republic), the British Government intervened, and rescued as much of the remaining territory as they could for the unfortunate Zulus. The people being unable themselves to form an orderly administration, it was found necessary to extend the Queen's authority over them, which was done by proclamation issued by Sir Henry Havelock, who was then Governor of Natal.

The area of Zululand is 8,900 square miles, and its population numbers a total of 145,884, of whom 548 are whites. Its revenue in 1891 was £51,313, and the expenditure £41,200. The Governor of Natal is the governor of the territory, and he is represented by a Resident Commissioner, Mr. Osborne, C.M.G., residing at Eshowe, which is in telegraph communication with Maritzburg. The country is divided into districts—Eshowe, Nkandhla, Entonjaneni, Ndwandwe, Nqutu, Ubombo, and Lower Umfolosi. Each district is ruled by magistrates, and order is maintained by a small body of Imperial troops and a force of mounted native police, under European officers. The natives of the Usutu and other tribes are settled within demarcated locations, and a hut-tax of 14s. per annum is levied from them, yielding over £31,000. Their pursuits are mainly cattle-raising and agriculture. Considerable crops of maize are grown, and each year the use of the plough in cultivation is becoming more extended. Many of the young men go out and seek employment, and return with good wages, earned on the railway and other works in Natal, Kimberley, and the gold-mines of the South African Republic.

The physical features of the country are attractive. Ranges of hills, with an elevation of 2,000 feet, and affording excellent grazing, alternate with slopes and valleys plentifully watered. There are some considerable areas covered with dense thorn-bush and forest; and in the latter, clearings have been made by the

natives, ruthlessly cutting down trees for the purpose of cultivating the richer and more fertile soil to be found below them, than in the open country. Along the valley of the Black Umfolosi, and the stretch of low-lying country towards St. Lucia Lake, on the coast, malarial fever prevails, which fact accounts for its being so sparsely inhabited; but large game abounds there, including rhinoceros, zebra, buffalo, wildebeest, koodo, water-buck, and other kinds of buck. The coast has no harbour, but Sordwana Point and Bay, as well as Lake St. Lucia, are included in the territory.

The occupation of lands by Europeans is not usually allowed, except for missionary, trading, or mining purposes. Mission stations in connection with various denominations have been established, and schools for the natives opened; the number of scholars on the roll being 719. In Eshowe district, a settlement has been established by the Salvation Army.

Gold, in quartz, has been found in different parts of Zululand; and gold-mining gives promise of being a payable industry. In the districts of Nqutu, Nkandhla, and Entonjaneni, some small batteries have already been erected, and gold extracted from the ore. There is a royalty of 1s. 6d. per ounce, and the revenue from this source in 1891 was £232. The development of the mining area is delayed on account of the want of capital; but efforts are being made to overcome this difficulty, by the formation of companies in Natal and elsewhere. Recent accounts report the occurrence, near the White Umfolosi River, bordering Zululand, of auriferous "banket" deposits from 18 inches to 4 feet thick, averaging over 12 dwt. per ton. Coal, silver, lead, copper, tin, iron, and asbestos are also among the minerals found in Zululand, but none of them, with the exception of gold, have yet been worked.

Adjoining Zululand, and lying between it and the southern boundary of the Portuguese possessions of Lorenzo Marques on the East coast, is the territory of Amatongaland, over which British suzerainty was established by treaty, made with the Queen Regent, Zambilli, in 1887. Its area is estimated at 5,300 square miles, and its population at 38,000 persons. The people, who are better known by the native name of "Mapootas," resemble the Zulus in certain respects, but are not of such splendid physique. They are remarkably industrious, and cultivate very much larger extents of ground than do the Zulu or the Natal natives. The country is an undulating plain, rising from 50 to 300 feet above sea-level, and in the summer season, from October to May or June, is a bad fever district. The Pongolo River, with its tributaries, runs along its north-easterly boundary, and joining the Usutu, forms the Maputa, which enters the lower part of Delagoa Bay, as a large river, navigable for small-draught vessels

for a distance of nearly fifty miles. The mouth of the Kosi River, on the coast of Amatongaland, is regarded as having the possibilities of a future harbour, in connection with a line of railway from there to the frontier of Swaziland, and the territory of the South African Republic, but those best acquainted with it consider that the Kosi mouth, which is an inlet for the sea to the lagoons and marshes in the lower part of the country, can never be of any use for the purpose.

Adjacent to the low-lying grounds of Amatongaland, on the inner side of the Lebombo Mountains, is the territory of Swaziland, at an average height of from 2,000 to 3,000 feet above sea-level. It is bounded on the east by the Portuguese territory and Tongaland, and on all other sides, for a distance of about 220 miles, by the South African Republic. Its area is 8,000 square miles, and its population is roughly estimated at 60,000.

The Swazies are of the Bantu family, like the Zulus and Ama-Khosa Kafirs, and their habits and customs to-day are much the same as they have been for many generations past. In the middle of the present century a dispute arose on the question of succession to the chieftainship, and the emigrant farmers of the South African Republic assisted Umswazi, father of the late chief Umbandine, on which account they have claimed a suzerainty over the nation. In recent years, however, the Swazies were conscious of the services rendered them by the Government of Natal, and especially by Sir T. Shepstone (Somtsu), who prevented Cetywayo from washing his spears amongst them. During the Zulu war they were in readiness to be called out, and sent about 8,000 men with the British troops, under Lord Wolseley, against Secocoeni. After the Transvaal war their independence was recognised by the Convention of Pretoria.

The people being pastoral, cattle are their chief property, the number in their possession being estimated at from 35,000 to 40,000 head. There is but little cultivation carried on, only sufficient to supply their immediate wants. The products are maize, millet, sweet potatoes, pumpkins, and gourds. The soil appears fertile, and the natural grasses abundant and of good quality. The western side of the country is well watered by numerous streams, having their rise among the broken foot-hills of the mountain ranges. It is there the chief mineral wealth of Swaziland is deposited.

During the summer, or rainy season, the climate is considered unhealthy towards the eastern side, and horses, mules and cattle are then kept as much as possible on the higher uplands of the western slopes. Here the grazing-lands are rich and luxuriant at the period of the year when those in the adjoining South African

Republic are at their worst; and the Boers neighbouring on Swaziland have been for years in the habit of trekking with their cattle in large numbers into the country, under grazing leases.

After the discovery of gold and its development in 1885 and 1886, a number of Europeans, principally British, spread over Swaziland. The late chief, Umbandine, fond of good living, good wine, and hunting, granted, for comparatively small considerations, various concessions for mining, trading, and agriculture. The white population, finding it absolutely necessary to protect themselves, obtained a "charter" from him, by which a committee was appointed, having judicial, taxing, and administrative powers. But the luxurious habits of the chief encouraged the crowd of concession-seekers about him, and the rivalry between them to gain an influence over him to promote their own purposes, resulted in jealousy and internal dissensions even among the committee. The chief afterwards fell ill, and affairs became worse, owing to the necessity of having to deal with his native councillors, some of whom were in power one week, and "smelled-out" or executed the next. When the chief died, in 1889, the position became still more chaotic, and neither life nor property seemed safe.

A joint commission was then appointed by the British Government and the President of the South African Republic, whose members proceeded to Swaziland to confer with the representatives of the tribe and the Queen-Regent. The main question brought before them was the validity of the concessions granted by the late chief. They numbered many hundreds, and were for everything that the ingenuity of man could conceive. They included customs, the sole right of laying out townships, the sole right to levy taxes of any nature or any amount, the sole right to practise as doctors, as lawyers, as surveyors, the sole right of banking, of advertising, of assurance, of posts, telegraphs, railways, of lotteries, photography, pounds, markets, mint, and "the sole right of obtaining concessions for others!" There were also concessions, the validity of which was disputed by the natives, especially the one which gave the right to collect the revenue of the chief. The result of the Commission was a Convention, by which the administration of the affairs of the whites was entrusted to three Commissioners, one, Col. Martin, C.M.G., appointed by Her Majesty's Government, one, Mr. Esselen, by the South African Republic, and one, Mr. T. Shepstone, C.M.G., by the Swazies; and a court, originally consisting of three members, was established in Swaziland, whose principal duty was to inquire into and decide upon the validity of every concession. Some 400 of these were confirmed, and as to those above-mentioned, which were originally strenuously disputed by the Swazies, all opposition to them was

withdrawn, and they were subsequently nearly all approved of. The most important concessions, relating to lands, customs, railways, &c., passed into the hands of the South African Republic.

Sir Francis de Winton had been sent out as Her Majesty's Commissioner, and, after the establishment of a joint provisional government, suggested broad lines of agreement as to the future of the country, which have since been the basis of negotiations. Among these were the withdrawal by the South African Republic of all claims or interference with the territory to the north and north-west of the Republic, where the British Chartered Company was carrying on operations; the expansion of the South African Republic to the eastward, and the entry of the Republic into a South African Customs Union, with the withdrawal of objections on the part of its Government to the construction of railways to their border, and readiness to consider further extension within the Republic. A conference followed between the High Commissioner, Sir H. Lock, and President Kruger, which was held at Blignaut's Poort, on the Vaal River, in 1890, when these matters were discussed, and a draft Convention, embodying the result of the negotiation, was submitted to the South African Republic.

In the meantime, the legal life of the provisional government in Swaziland was drawing to a close, and it was intimated to President Kruger that if no settled form of government was established, the alternative would be to appoint a British Commissioner in Swaziland, supported by such force as might be necessary to maintain law and order, in accordance with the provisions of the London Convention of 1884.

As the Executive of the South African Republic raised objections to the draft Convention, the High Commissioner, in view of the gravity of the situation, pressed the Hon. Mr. Hofmeyr, the leader of the Afrikaner Bond party in the Cape Parliament, to undertake the task of explaining the situation to the Government at Pretoria. Mr. Hofmeyr patriotically consented to do so, and was successful in smoothing away the difficulties in the way of a settlement. In August, 1890, the Convention was ratified by the Volksraad at Pretoria. It affirmed the independence of the Swazies, as set forth in the London Convention. It established for an indefinite period a joint government of the territory by the British, the Republic, and the Swazi representatives; a chief court having jurisdiction over all persons of European extraction, and the affairs of the natives being regulated by native law and custom. It recorded the agreement of the Republic to withdraw all claims to territories northwards, and to support the authority of the British South Africa Company. It granted the assent of the Queen to the acquisition by the Republic of land in Swazi-

land, and the adjoining territories of Umbegeza and Zambilli, for the construction of a railway to Kosi Bay; but it stipulated that if, before the 8th of August, 1893, the Republic should not have entered the South African Customs Union, the Convention might be terminated upon notice given by either of the parties to it.

The required notice of the termination of the Convention on the 8th August next has been given by the President of the Republic; and further negotiations were concluded in June this year between the High Commissioner, on behalf of the British Government, and the President of the South African Republic, with respect to the future government of the country. The result has not been announced, but it is anticipated that Swaziland will be ceded to the Republic, due provision being made for securing to the Swazies an equitable apportionment of their lands, and to British and other residents who have invested capital in mining or other commercial enterprises, a protection of their personal interests and political rights.

CHAPTER XXII.

BASUTOLAND—THE SWITZERLAND OF
SOUTH AFRICA.

BASUTOLAND, often called the Switzerland of South Africa, is a narrow strip of country lying between the river Caledon (which separates it, for the northern half of its length, from the Free State) and the Maluti and Drakensberg mountains. Its estimated area is 10,263 square miles, and it lies about 6,000 feet above the level of the sea. The physical aspect is very mountainous; the whole country is undulating and dotted over with hills, some flat-topped and some peaked, generally of aqueous origin and composed of sandstone. In places, iron-stone or volcanic outcrops, are seen. The country is a succession of hills and valleys, covered with grass, and watered by innumerable streams and fountains. The soil is fertile, and yields in abundance grain of all sorts, in the valleys and plains that lie between the spurs of the Maluti and the Caledon river, which comprise the inhabited part of the country. The Maluti mountains are chiefly used as cattle grazing stations, and only inhabited to any extent within the first spurs; further on, the villages grow fewer and fewer, till nothing is found but a few cattle stations. The mountains are supposed to be rich in mineral wealth, but have never been properly explored; and the jealousy of the chiefs and people, as well as the disinclination of the Government, have so far prevented their resources being ascertained. Coal is abundant, and mines have been opened and worked, but here again the conservative tendencies of both people and Government have not encouraged scientific and practical exploration. The country is believed to be one of great possibilities as regards the development of mineral wealth, but at present it is a sealed book to the prospector and explorer. Except in the ravines of the Maluti, it is quite devoid of wood; and the traveller may go a day's journey without seeing a single tree or bush. The rivers formerly were fringed with willow-trees, but these have all disappeared. Generally it is a sorry spot for the enthusiastic sportsman, who will find game about as plentiful as on Clapham Common. Birds may be excepted from this statement; partridges are found on the

mountains, ducks on the pans, and quail and pigeon in the fields in abundance. In the recesses of the Maluti and the Drakensberg, some of the antelopes, including the eland, are still extant. The rivers contain yellow fish and barbel in considerable numbers. On the sides of many of the mountains large caves are found, in which ferns of various kinds grow, and in places the rocks are ornamented with Bushmen drawings. Within a few miles of the village of Tlakenels, in the Maluti, is the cave of Schonghong, formerly the home of the last Bushman chief, Soai, who ruled in the country. The remnant of the tribe was destroyed by the grandsons of Moshesh in 1871, in retaliation for repeated cattle thefts. Sir Marshall Clarke, who recently visited the cave, says:—"It is a simple overhanging rock, the wall in rear being covered with pictures of hunting scenes, war dances, predatory expeditions, and various wild animals. Eland, hippopotami, and the smaller buck are all recognisable, while occasionally is depicted the uncouth form of the rain-god. In all the fighting pictures, the Bushman is shown victorious. He is drawing the bow with tiny hands, or balancing himself on shapely feet throwing the assegai. His foes on the other hand are exhibited with disproportionately big hands, fleeing on calfless legs stuck like broom-handles into the middle of their feet, and in the rear appear Bushwomen and boys driving herds of horses and cattle, the spoils of victory."

Horses and cattle flourish in the country, and goats are met with in large flocks, but sheep to a less extent. The Basuto ponies are hardy animals, with great powers of endurance and wonderfully agile, skipping like goats over the boulders and loose stones that strew the mountain paths, and rarely missing their hold. They are small in size and carelessly bred, as well as badly fed and cared for. The Government have recently introduced two Arab stallions, and placed them at the service of the Basutos, with a view to improve the breed of horses. No pains whatever are taken in the breeding of cattle; hence they are of a most inferior class, merely serviceable for ploughing and draught purposes. Many of them are small, and the cows give but little milk during summer and practically none in the winter.

The principal occupation of the people is agriculture; vast fields of mealies and Kafir corn extend from one end of the country to the other. Corn and forage is also grown, but of an inferior sort, owing to late sowing and indifference as to quality of seed; but not due to any fault of the soil or climate, which are both admirably adapted to the raising of grain of the best quality. The methods of agriculture are rude and imperfect; no machinery of

any sort is in use, and the common one-furrow plough, the hoe, and the sickle are the only implements at present in the country.

There is no doubt that, when corn is properly cultivated and machinery brought into use, the capabilities of Basutoland as a wheat-producing area will not be surpassed by any part of the world.

The Basutos are generally industrious and thriving. They make good servants, as far as a savage race can be such, but very soon tire of work, and then want to go home to rest. They are keen traders, possessing an excellent idea of looking after their own interests in any commercial transaction. Stores and shops are established at various places, where they exchange grain and other produce for goods, or sell it for money. The import value of the merchandise which passed into the territory, during the eighteen months ending on 31st December, 1892, was £35,644 from the Cape Colony, and £42,000 from the Free State. The produce of the country, in the same year, was valued at £250,000.

The census, taken in April, 1891, showed the population of Basutoland to be 218,324 natives, and 578 whites. In 1875, the return was 127,707 natives and 469 whites. The local revenues in 1892 amounted to £23,784, of which hut-tax contributed £19,611, and licences £1,382. The total number of schools was 115, and of these 101 belong to the Paris Evangelical Mission, 7 to the Roman Catholic, and 5 to the Church of South Africa. The number of pupils on the Romish attendance roll was 6,932, and the mean average attendance 4,560. Government grants to the amount of £3,414 are given in aid of schools in proportion to the number of pupils and the education afforded. The training school at Morija offers a sound English and Sesuto education, and provides native teachers for the country. At Roma there is an industrial school, in which instruction is given in building, carpentry, tailoring and other trades, and a school for girls, where, in addition to the usual elementary course, they are taught spinning, weaving, and other domestic arts. A number of boys are placed by the Government to learn trades at the Lovedale Institution, Cape Colony, and at the Trappist Monastery in Natal. European clothing is now in general use in the country. Polygamy is still practised to a large extent, and doubtless stands in the way of the bulk of the people becoming members of some Christian church. Witchcraft and the atrocities of "smelling out" are abolished; for as early as 1855 Moshesh issued his word forbidding them, declaring that he, his brothers, and all the men of the tribe "spit on the lie of witchcraft, and cover its face with their spittle."

The Basutos were organised as a nation by their chief Moshesh, who flourished from 1815 to 1870, the date of his death. He was the son of a minor chief of little note, and began by collecting and consolidating a following of the Bechuana tribe, and by war and diplomacy gradually increased his power and widened his borders. His memory is held in the greatest reverence to this day, and his sayings and doings are constantly quoted to the people by the chiefs and counsellors as miracles of wisdom, and regarded as precedents to guide their proceedings. Moshesh, or Moshueshue, as he was named in the native dialect, was the



THE BASUTO CHIEF MOSHESH.

most astute and sagacious of the barbarian chiefs South Africa has produced. At the outset of his career, when the principal men of the country were carried away by the invading armies of Chaka, he alone breasted the stream. He took refuge on the top of Thaba - Bossigo, an isolated mountain 400 feet high, with a tableland of two or three miles on the top, accessible only by five wide clefts, easily barricaded. There he was known as "the Chief of the Mountain," and rallied round him the wretched remnants of the broken tribes. The horrors of war and famine had produced in his neighbourhood associations of cannibals living in caves, who laid hold on men, women and children wherever they could; but his

clemency towards them induced them to abandon their abhorrent habits and return to their former position.

One of these cannibals, who was known to have killed and eaten the chief's grandfather, Pete, was brought before him. Moshesh was urged to kill him; but he replied, "No; men-eaters are living sepulchres. Why should I disturb my grandfather's grave?" By this and other acts of clemency he secured the attachment of representatives of families who had formerly governed. One or two successful predatory expeditions largely increased his herds of cattle; and with these he purchased wives

for the poor among his people, bestowing partners upon them on condition that the cattle received as *ukulabola*, in native fashion, for the female children when they married, should revert to him. Thus he gained the goodwill of his followers, and a source of ever-increasing personal wealth. Even among the invaders of his territory he procured himself allies by his peculiar diplomacy, knowing how to resist and how to yield at the right moment. Moselekatse's regiments on one occasion had attacked his stronghold: they rushed up its sides in great numbers, but an avalanche of stones, accompanied by a shower of assegais, sent them back with more rapidity than they had advanced. Their repulse was decisive, and the Zulus had to march away. At the moment of their departure a messenger came towards them, driving some fat oxen, with the word of the chief: "Moshesh salutes you. Supposing that hunger has brought you into his country, he sends you these cattle, that you may eat them on the way home." The Zulus were amazed. "This man," said they, "after having rolled down rocks on our heads, sends us oxen for food. We will never attack him again." And they kept their word.

Moshesh welcomed the representatives of the Paris Evangelical Society, who visited him for the first time in 1833. He did not accept their doctrines himself, but he thought their teaching good for his people. From this time a new era unfolded itself for his tribe; thousands of Basutos, dispersed by the misfortunes of past times, recovered confidence, grouped themselves about the mission stations, and augmented his power and influence. His country, where none had been daring enough to venture, for fear of falling into the hands of the devourers of human flesh, began to attract attention. Many refugees belonging to broken tribes sought an asylum under his government, which was famed and respected for its wisdom and moderation. Traders also followed in the wake of the missionaries, and began to dispose of their commodities. Some of the emigrant farmers moving out of the colony were encouraged to sojourn for a while and occupy the depopulated lands around him. The chief said, "He admired the white people; they might remain for years if they liked." In a short period the Basuto population increased in an astonishing degree; mountains and valleys became covered with numerous villages, and the people pressed forward amongst the adjacent native tribes and European settlers. Then arose questions of territorial rights. Moroko, who with some Baralongs had taken up a position at Thabanchu, maintained that he had paid Moshesh a quantity of cattle for his territory. Sikonyella claimed the country occupied by the Mantatees as his by right of conquest. The Boers, who had cultivated and improved their lands, asserted that they had

been assured peaceful possession of them, some in consideration of being a wall of defence between Moshesh and the Griquas, and others because they had purchased from the son of a Basuto chief, whose family had formerly governed the country. Moshesh, however, refused to acknowledge any of these claims. He asserted that the whole country was the property of the Basutos; that no instances of selling or in any way alienating land were known amongst them; and that he had only granted his hospitality and protection to Moroko and the Boers, during their occupancy of the land. "He had lent them the cow to milk; they could use her, but he could not sell the cow." He therefore claimed the position of chief paramount over the country, wherever any of his people had ever lived, and this gave rise to disputes and disturbances, ending in internecine strife.

For the maintenance of peace and order, the Governor of the Cape Colony in 1845 found it needful to interpose his authority north of the Orange River, and in 1848 the Queen's sovereignty was proclaimed over the territory from the Orange to the Vaal River. A small body of British troops assisted a British Resident in maintaining his authority. But the quarrels between the several native occupants led to a state of chronic warfare, in which some of the Basuto clans were the chief aggressors; and on one occasion, in 1851, the British force, which had gone out to protect the Baralong chief, Moroko, had to retire before them at Viervoet, near Platberg. To restore British prestige, an army of over 2,000 men, under General Sir George Cathcart, moved into Basutoland, in the direction of Moshesh's residence. A demand was made upon the chief for 10,000 head of cattle and 1000 horses, to be delivered to the British Resident within three days' time, in order to be restored to the various native tribes from whom they had been taken during the disturbances. The demand was disregarded. Thereupon Sir G. Cathcart moved forward to chastise the Basutos, with a force consisting of a regiment of Lancers, a battery of artillery, and two regiments of light infantry. Between the camp and Thaba Bossigo there lay the Berea mountain—an extensive tableland with irregular precipitous edges—upon which armed bodies of Basutos and droves of cattle were seen. General Cathcart ordered his men to march in three columns. One, under his own personal observation, was to move along the western base of the mountain. Another, under Colonel Eyre, was sent to sweep its summit; whilst a third, under Colonel Napier, with the cavalry, was to reconnoitre round the east side, and afterwards meet and join the other two on the plains of Thaba Bossigo, in sight of the chief's residence. The Basutos were evidently prepared for defence; the full

strength of the fighting men of the tribe—10,000 in number—under their captains, was assembled. They were chiefly centred about Thaba Bossigo, but groups of them, well mounted, were visible closely watching the movements of the troops, as the first column rounded the southern angle of the Berea. Noon was the time appointed for the junction of the forces before Thaba Bossigo, but it was evening before Colonel Eyre's column appeared. Colonel Napier's party became broken and separated. Attracted by a drove of cattle on the mountain, they went in pursuit, capturing a number; but on returning, took a wrong path and were attacked by the enemy. Twenty-seven of the Lancers were killed, and their horses, uniforms, and trappings appropriated and donned by the Basutos. Colonel Eyre's column on the mountain saw great troops of cattle, estimated at 30,000 head, but 1,500 was as many as they could manage to drive, and the rest were abandoned. Suddenly they were confronted by a number of mounted men, some with white caps on their heads and bearing lances, causing them to be mistaken for the General's escort. Several soldiers fell into their hands before it was discovered that these were Basutos who had dressed themselves in the uniform of the 12th Lancers. Colonel Eyre had hard work in fighting his way through, descending from the heights and driving the cattle before him to the plains below. He arrived just in time to join the General, who was being attacked by the main body of the Basutos, all mounted men, who advanced with remarkable boldness, essaying to surround the troops on all sides; but the admirable discipline of the British infantry, and rounds of canister from the artillery, repulsed and overcame them. It was long after dark before the firing ceased. That night the army bivouacked upon the field, and when morning broke, as no enemy was to be seen, they marched back with their guns and captured cattle to the camp, a distance of fourteen miles, intending to resume operations on the chief's residence in the course of a day or two, for the troops were eager to avenge their losses on the Berea.

But Moshesh, on the previous midnight, had held a council at Thaba Bossigo, and dictated a letter to the General, in which he said, "You have fought against my people and taken much cattle; I entreat peace from you. You have shown your power; you have chastised; let it be enough, I pray you, and let me no longer be considered an enemy to the Queen." Sir G. Cathcart thought it expedient, under the political condition of the country, to accept the chief's submission in this form, without further prosecution of the war. He issued a proclamation declaring peace with the Basutos, repudiating for the future any interference on the part of Government in native quarrels, and giving the European

population full licence to protect, secure and recover their property according to the old colonial "commando" system. Meanwhile Moshesh was blazoning forth his triumph, sending messengers far and near to Kafirs, Zulus, and Bechuanas, that he had victoriously driven the English forces from his country.

Soon after this, the Queen's sovereignty over the Orange River Territory was withdrawn, and the natives, as well as European inhabitants, were thrown upon their own resources, and left to maintain their independence as best they could. No definite limits had been appointed between the Basutos and the newly established Free State, and the question of boundary became the foundation of an endless series of disputes. War broke out, and was carried on with varying fortune between 1858 and 1868. The Basutos, who were poorly provided with guns and ammunition, soon ceased to attempt meeting the Free State burghers in the open, and acted on the defensive, ensconcing themselves in fortified mountains and caves. Moshesh saw his people losing ground, and a good part of his country in possession of his enemies. With characteristic foresight, seeing the destruction of his tribe was inevitable, he made overtures to the High Commissioner for their acceptance as British subjects. He entreated "that he and his people might rest and live under the large folds of the flag of England before he was no more." To this entreaty the High Commissioner, Sir Philip Wodehouse, yielded on the 12th March, 1868.

At the time the British Government thus stepped in and saved the Basutos from utter annihilation, the territory occupied by them was reduced to one half of its original extent, 2,000 persons had been killed in the war, and many of the tribe (to the number of 15,000) had left the country. The remnant was crushed and humbled. They were in an impoverished state, and their outward aspect most miserable; clothed in ragged skins, many of them nearly naked, sick and emaciated, they seemed the lowest of human beings. The power and prestige of Moshesh's sons, the principal chiefs, were broken and their authority gone; and a favourable opportunity presented itself of abolishing many of the native customs obstructing the path of civilisation and progress. But the delay which occurred in the ratification of their formal recognition as British subjects, and the time which elapsed before the judicial functions of the new Administration were set in motion, enabled the chiefs to recover their power with rapid strides, and thus diminish the influence of the Government.

In 1871, the country was annexed to the Cape Colony. The people, as in the Transkeian territories, were placed under special laws and regulations, and governed by European magistrates, at

the head of whom was Colonel Griffiths, C.M.G., as the representative in the country of the High Commissioner. Under this *régime* the country prospered for several years; the revenue exceeded the expenditure, and Basutoland had a comfortable surplus, which was only used for improving the country. Trading stations sprang up, and hundreds of wagons were engaged in collecting and exporting the grain grown by the people to the Free State and the Diamond Fields. Money came into general use, and commerce was developed. The exports were estimated at about 2,000 bales of wool and 100,000 muids of grain, besides a considerable number of cattle and horses.

During these years, the unrestricted sale of arms and ammunition at the Diamond Fields enabled the natives easily to acquire guns; and numbers of the Basutos, at the instigation of their chiefs, went there to work, mainly to obtain these weapons. In 1880 the Cape Government, in pursuance of the policy of the disarmament of the natives, required of them to surrender all their arms, compensation being given for the same. This measure was most distasteful to the Basutos, although it was endeavoured to be impressed upon them at their "pitsos," or public gatherings, that it was a step taken to secure peace and prosperity throughout the country. The chiefs seized the opportunity for influencing the tribe to oppose the law, and the ignorant and credulous were told that, when disarmament was accomplished and the nation left defenceless, polygamy would be abolished by force, their women taken from them, their cattle branded so as to mark them as Government property, and finally the people enslaved.

On the issue of the disarming proclamation, some loyal chiefs and natives obeyed the order, and surrendered their arms; but the fact of their doing so drew upon them the enmity of the other chiefs, who according to native custom "ate them up," threatening their lives and carrying off their cattle. A troop of the Cape Mounted Riflemen then moved up to Basutoland, for the protection of the loyalists. They were met on the border by armed forces of the Basutos, who resisted their entry, and afterwards in great numbers attacked their camps and the magistrates' stations. In September, 1880, nearly the whole tribe was in revolt; and within a week or two afterwards there was a rising of the Basutos in East Griqualand, followed by that of the Pondomise, Amaquate, and Tembus, and other tribes on the eastern side of the Drakensberg.

The burgher forces of the Cape Colony, together with Volunteers and auxiliary corps from all the principal towns, were at once sent to the front, and in a comparatively short time the outbreak in Griqualand East and Tembuland was suppressed.

Afterwards, strenuous efforts were made to reduce the Basutos to submission by force of arms, but without success.

The newly-arrived High Commissioner, Sir Hercules Robinson, offered his services as mediator and arbitrator, and these being accepted by the Colonial Government, as well as by the Basutos, he gave an award, the terms of which were a surrender of guns by the Basutos, and liberal issue of licences to carry arms on payment of a licence fee; restoration of property taken from the loyal; compensation to traders for loss of property; and payment of a fine of cattle by the tribe. These conditions, although accepted by the Basutos, were not complied with; and all efforts to re-establish government in Basutoland were unsuccessful. Public opinion in the Colony was in favour of the abandonment of the territory. The Imperial Government, believing this step would have a disastrous effect, undertook to administer it on certain conditions—one being that the Colony paid towards the cost of its government an equivalent to the amount of customs duties received on goods sent into the territory; the other being that, if the Basutos did not give proof of their appreciation of British intervention by assisting the administration in every way, the Imperial Government would not hold themselves bound to continue it.

This agreement was accepted. In 1884 the Imperial Government resumed control of the country, appointing as Administrator Sir Marshall Clarke, who still governs it under the High Commissioner. The Basutos since then have been increasing fast, and land is getting scarcer every year. They enjoy a sort of Home Rule, subject to the control of the authorities, and the chiefs exercise considerable power over their people. Drink is most strictly prohibited from entering the country under any pretence whatever, unless a permit has been granted for its introduction; and so strictly is this excellent law carried out that a gentleman visiting Basutoland not long ago was brought up before one of the magistrates for having a pocket-flask in his pocket containing some whiskey, and fined £1 for contravention of the Liquor Law. There is no doubt that the stringent regulations in force against the introduction of alcohol have been of the highest benefit to the Basutos, and it is earnestly to be hoped that the authorities will never abrogate the rules that now exist. When the High Commissioner, Sir Henry Loch, visited Maseru in 1890, about 15,000 men from all parts of Basutoland were camped there for three days, and during that time there was not a drunken man to be seen anywhere, and no quarrels or unpleasant incidents of any sort occurred. The Basutos when journeying or campaigning carry with them a supply of maize, ground very fine, roasted, and

mixed with sugar and salt; this is often their main maintenance for weeks at a time. At this gathering 12,000 mounted and armed warriors received the Queen's representative, and, as he passed between their ranks, it was noticeable that chiefs and clans, which but a few years ago were hostile to one another, were riding side by side, contending only in the energy with which they gave utterance to the chant of welcome and in the cordiality of their greetings.

The land in the Territory is held on the Communal principle. No person, black or white, can actually own land in Basutoland, but can only have permission to occupy it, and build upon it at his own risk, though no difficulty is made in the transfer by sale or otherwise of such properties from one white person to another, it being always understood that there is no ownership of the ground. White persons are not allowed to settle in Basutoland unless they can show that they have some good reason for being there, such as for the purpose of trading, or following some legitimate pursuit. Beyond the charge for licences to trade, no taxes are demanded from the whites by the Government, but the Basutos pay a hut-tax of 10s. per annum, which is the main source of the revenue. This is sometimes paid in money, and sometimes in grain or other produce.

The Basutos live in villages scattered about the country; some of the huts are round, and others square houses, made of sod and thatched. They are very fond of conviviality, and "beer drinkings" are constant events. Internecine war on a small scale occurs every now and then. A dispute arises between two neighbouring chiefs, the country side is aroused, the men all turn out armed, firing soon begins, and a few get killed or wounded; then the nearest Government official goes to the scene of events, and by persuasion or threats the matter is quieted down; then a "mixed Commission" of Government officials and native chiefs sits on the case, hears evidence, punishes the provokers of the strife, and things quiet down till the next cause of dispute arises, and then the programme is gone through again.

The border between Basutoland and the Free State is patrolled by the police of both Governments, and peace and quietness have now reigned for some time, with only occasional complaints, generally arising from some petty thefts or disputes. Serious criminal cases are tried by the magistrates; civil cases can be brought before the magistrate or the chief, at the option of the disputants. There is no doubt that the chiefs possess great power in Basutoland, and often exercise it. As a rule, in important matters they refer to the Government, being to a great extent guided by its decision; but it is apparent at times, when some

important matter crops up, that it requires considerable tact and *savoir-faire* on the part of the officials to make matters go smoothly.

What will be the ultimate status of Basutoland it is somewhat difficult to prognosticate. The Government, as now constituted, has accomplished much in preserving a fair amount of law and order; the taxes are paid well and willingly; life and property are safe; there is peace on the border, and the nation is prospering and progressing. The moral influence of the officials is an ever increasing power in the country, which was in a state of chaos in 1883 before the Imperial Government took it over, and its condition now is infinitely better than it was then. Patience and tact have achieved, and are achieving, much; and all that could be done, with the means at disposal, has been done to bring the Basuto to be a sober, peaceful, industrious and law-abiding tribe. Still, it must be remembered that they are savages, headed by chiefs who are tenacious of their power, and apt at times to be restless and intolerant of control; and that in Basutoland, as elsewhere, history may repeat itself, and "moral force" be swept away by some torrent of national feeling too strong to be stemmed by the best-directed efforts of suasion, argument, and entreaty.

CHAPTER XXIII.

BRITISH BECHUANALAND AND THE BECHUANA
PROTECTORATE.

BECHUANALAND is the name given to the central part of South Africa situate north of the Cape Colony, and west of the South African Republic, to the 20th meridian of east longitude.

Ever since this territory was first visited by Europeans, about 1801, it has been known to be inhabited by the mild, tractable, and peaceful Bechuana people, bearing the tribal designations of Batlapin, Baralong, Bakwena, Batlaros, Bangwaketse, and Bamangwato. Among a portion of them, the Christian missionary, Robert Moffat, laboured for nearly half a century, reducing their language to writing, translating and giving them the Bible in their own tongue, and teaching them by the opening up of springs and fountains, together with a knowledge of irrigation, how to turn to good use the agricultural resources of the country. Among some of the others, Dr. Livingstone was a worker, before he resolved to become the pioneer of those explorations which have since opened up the Continent to the civilised world. And to their successors in the mission-field, is due the credit of having educated and trained the wisest and most enlightened of African chiefs—Klama, to whose splendid character, traders, hunters, travellers, and the highest officials unite in bearing testimony.

The Bechuanas were always rich in cattle, native sheep, and goats. Near the villages, where they congregated under their chiefs, they had their gardens and cornfields. Outside of them, were their cattle-posts with wide ranges of pasture. Beyond these, skirting the borders of the Kalahari desert, and sometimes in the heart of it, were hunting stations, where their vassals or slaves, the Bakalahari and the Bushmen (known as the Barwa and Marawas) gave personal service or paid tribute in the form of skins, feathers and other produce of the chase. Large trading transactions with these people were carried on for many years by Cape colonists from the eastern and border towns, who visited them and traversed the country in every direction. In course of time, this commerce was extended still further northward to the Zambesi, and the missionaries' and hunters' roads through

Bechuanaland became the main route by which nearly all the merchandise passed northward and the native produce came southward from the interior.

The Bechuanas had no war-like system, like the Kafir or the Zulu, and although there were occasionally tribal dissensions and revolutions among themselves, they never disturbed the general peace of South Africa. Along their eastern border, after the establishment of the South African Republic, the emigrant farmers laid claim to the control of the country on the ground of their conquest of the Zulu usurper Mosalekatse; and on the strength of this claim, and the latitude given by the Sand River Convention, President Pretorius in 1868, issued a proclamation declaring the western boundary of the Republic to extend in a line from the Langsberg to Lake Ngami. But Her Majesty's Government protesting against this act, and refusing to recognise its validity, the proclamation was recalled.

The Bloemhoff arbitration and the Keate award, in 1871, which were both repudiated by the South African Republic, contained the first germs of those troubles, which afterwards agitated the country. The award cut off from the South African Republic some of the chiefs, who had formerly been included in it, and gave a status to chiefs outside of it, whose claims were disputed by others. In the Pretoria Convention, signed after the retrocession of the Transvaal State, a new intermediate boundary was laid down, in the hope that it would satisfy all parties; but this line, equally with the other, was held to be in conflict with the claims of the Republic and its native allies. After the close of the Transvaal war of 1881, hostilities broke out between the rival parties, and the territory being regarded as an independent one, many white volunteers, or freebooters, joined as mercenary partisans of the contending chiefs, sharing in the cattle which was captured as booty, and attempting to set up minor republics in the lands they had helped to conquer.

In the negotiations between Her Majesty's Government and the delegates of the South African Republic, which took place in London in 1884, it was agreed that an end should be put to the miserable state of anarchy which prevailed. A boundary line was agreed upon between the two governments, which placed within the Republic the native chiefs who were claimed as its allies, and the free-booters associated with them. At the same time, on the recommendation of the High-Commissioner, Sir Hercules Robinson, and with the concurrence of the Cape Premier, Sir T. Scanlen, the British Government decided to form a Protectorate over the whole of Bechuanaland lying outside of this amended western boundary of the Republic, in order to retain for the Cape Colony

the trade route to the interior, as the only opening through which colonisation under British influence could find expansion northwards.

In pursuance of this policy, the Rev. John Mackenzie, who had long been engaged as a missionary in promoting the interests of the Bechuana people, was sent as a Deputy-Commissioner, and he concluded treaties with the native chiefs, who had repeatedly applied for British protection, and who readily made cession of all their rights of government to the Queen. Some of the freebooters, however, still continued to occupy the country, and made attacks upon one of the chiefs under British protection, which was protested against by Mr. Rhodes, who had succeeded Mr. Mackenzie as Commissioner. Her Majesty's Government then determined upon collecting and despatching a military force of about 4,000 men of all arms, to clear the territory of the freebooters, and establish peace and order. The command of this expedition was entrusted to Sir C. Warren, R.E., who successfully accomplished the work, and held the country until its further destination was finally decided upon.

In 1885, the Imperial Government resolved to proclaim the Queen's sovereignty as far north as the Molopo River, which territory was named British Bechuanaland; and soon afterwards an Order in Council was issued declaring a British Protectorate over the country to the 22nd parallel of south latitude, and extending the sphere of British influence to the Zambesi. By a further proclamation, issued in 1891, the western boundary was extended to the 20th meridian of east longitude, coterminous with that of the German Protectorate, and embracing the districts of Gordonia and Mier.

The area of the Crown colony of British Bechuanaland is now approximately 60,777 square miles. At the census of 1891 the white population numbered 5,211; the coloured mixed races, 7,472; and the Bechuanas in the several districts, according to the return of the collector of hut-tax, is at Taungs, 19,800; at Mafeking, 10,015; at Vryburg, 6,068; at Kuruman, 11,770; making 47,650 persons, giving a total population of 60,333.

The Governor of Cape Colony is also governor of Bechuanaland, with power to legislate by proclamation, but the duties of administration are carried on by Sir Sidney Shippard, the deputy commissioner and chief magistrate. The laws in force are assimilated to those of the Cape colony. The divisions of the country are Vryburg, Mafeking, Taungs, Kuruman, Gordonia, and Mier. Vryburg is the principal town, and the seat of government. At present, it is the terminus of the Cape railway system; but the construction of the line to Mafeking is now in progress, and on

completion it will probably be further extended northward to Palachwe or the Tati gold-fields.

Since the establishment of the government, the revenue of the colony has steadily increased. In 1886-87 it was only £11,757; in 1889-90, it was £19,548; and in 1891-92 it amounted to upwards of £52,000. The expenditure exceeds this sum, reaching £151,000; but this includes the cost of the Bechuanaland Border Police, a force of 462 officers and men, under Col. Frederick Carrington, maintained chiefly for the Protectorate north of the Crown colony, and costing about £100,000, for which a grant in aid is made by the Imperial Government, as well as a contribution from the British South Africa Company, for Protectorate expenses. Among the ordinary sources of revenue are hut-tax, licences, stamps, and transfer and auction duties, quit-rents, land sales, post office and telegraph receipts, and customs duties, collected under the South African Customs Union, of which British Bechuanaland is a member.

The eastern portion of the territory is on a plateau ranging from 3,200 to 4,200 feet above sea-level. It forms an undulating prairie of fine grass-lands in most parts devoid of bush or scrub, and in others dotted over with trees, giving the locality the character of being well wooded and occasionally sufficiently thick to form patches of forest. The variety and quality of the various grasses make the pasturage in good seasons, one of the best for cattle. The country is therefore well suited for cattle-ranching. The Cape sheep and the common goat also thrive. The majority of farms, however, are as yet unsuited to the merino sheep, although it is probable that after a few years of close grazing, the conditions may be more favourable for them. The superior pastures and the fertile soils are generally met with in strips along the valleys and dry river-beds. In other parts, there are stretches of limestone flats, nearly bare of soil, but covered by scrub and an undergrowth of sweet grass; but on certain places stock do not thrive, being afflicted by a peculiar bone disease, which is only cured by artificial feeding and care.

Large areas in the best part of the country have been set apart for the natives as reserves or locations, and many of them are well suited for agricultural productions. Maize and millet are the principal grain crops grown. They yield remarkably well, considering that the ground is simply scratched, never manured, and without irrigation. At Taungs, along the line of railway passed by the traveller to Vryburg, there are about 27,000 acres cultivated, and upwards of 132,000 bushels have been sold for exportation, while probably an equal amount is reserved for their own use. At Molopo, Mosiba, and Setlagoli native reserves,

about 31,136 acres under cultivation produce on an average twelve bushels per acre, or 373,632 bushels. In Lower Kuruman native reserve, about 300 acres are dry lands and 340 acres irrigated; and the annual crops from them are estimated at 6,000 bushels of maize, and 6,900 bushels of Kafir corn. Wheat is grown at Kuruman, and near Vryburg. Fruits and vegetables do well at both these places, and with irrigation all kinds of cereals and orchard produce should succeed in any part of the country.

In the districts of Vryburg and Mafeking the annual rainfall is considerable, averaging 25 inches, and at Mafeking in 1890-91, which was an excessively wet season, it was as much as 44.37 inches. At Upington it is not more than 12 inches. Owing to the porous nature of the greater part of the ground, the water is rapidly absorbed; but, by a fortunate provision of nature, it is not lost, as the country, which consists of rocks of the primary formation is generally reticulated with intrusive dykes, which impound the water in subterranean cavities. There are many natural permanent springs, and some "pans" or depressions which hold water. Well-sinking has been resorted to with success in a number of instances; but in some cases with disappointing results, owing to the sites being unfortunately chosen. The Government, however, is now prosecuting the work of water-boring under professional guidance, and there is little doubt that in course of time the lower water-levels of the country will be tapped and utilised for the larger development of its natural resources.

Of the total area of British Bechuanaland (exclusive of the 15,000 square miles of newly-annexed territories on its western border) about 27,500 square miles have been allotted by grant or sale, and over 12,200 square miles are available for disposal. Of the lands allotted, 12,003 square miles, chiefly in the divisions of Kuruman, Vryburg, and Mafeking, are held by the Cape Government and the South Africa Chartered Company as a subsidy for the construction of the railway from the border to Mafeking. About 992 square miles, situate in the Mafeking division, have been purchased by the Bechuanaland Estate Syndicate, and 1,014 square miles in the Vryburg division, by the Southern Land Company. Of the lands sold, the maximum sum paid per acre was 4s. 1d., and the minimum 1s. It is difficult to state the present average price of farms, their value depending altogether upon their soil, pastures, and water capabilities. They vary from £200 to £2,000. Within the last two years there has been a considerable settlement of farmers, who have flocked in from Cape Colony, the Orange Free State, and the South African Republic.

The area of the Bechuana Protectorate is about 386,200 square

miles. The jurisdiction of the British Commissioner and his assistants extends from the border of the Crown Colony over the country between the Shashi and Macloutsie Rivers, including the district of the Tati and its gold-fields, and northwards of the 22nd parallel of south latitude over the territories belonging to the chief Khama, and those lying north and west of Lobengula's territory. The principal tribes living in the Protectorate are the Bamangwato, under Khama; the Bakhatla, under Lenchwe; the Bakwena, under Sebele; the Bangwaketse, under Bathoen; and the Bamalete, under Ikaneng; all of whom are independent of each other. The most important is that of the Bamangwato, under the chief Khama, whose principal town is Palachwe, with a population of 25,000 inhabitants, spread over a wide expanse of ground in the well-watered and fertile region below the Choping Hills. One of the remarkable achievements of Khama was the removal of his capital from Shoshong to this place. In two months the entire urban population migrated from the one locality to the other, where every family was well and comfortably housed, streets laid out, and gardens ready for cultivation. It is worthy of note that this chief does not allow of the introduction of a drop of intoxicating liquor throughout his "sphere of influence."

The western portion of Bechuanaland embraces the so-called Kalahari desert, and the territory on its southern edge known as Gordonia and Vilander's country. Within the district of Gordonia, of which the village of Upington, on the north bank of the Orange River is the commercial centre, there are tracts of good grazing lands, although some parts are worthless, owing to lack of water. North of this, and to the west of the supposed course of the Hygaab or Molopo River, is Vilander's country, of which Naas, or Mier, with the Rhenish mission station of Reitfontein, is the centre. Most of the farms here have a fair proportion of hard ground, consisting chiefly of limestone, covered with the small Karroo bushes, on which cattle, sheep, and goats thrive well. The best and finest of them are between Narongas and Mier. These are first-class cattle and sheep-runs; but it is doubtful if they will ever be much more, the rainfall being too uncertain, and the water supply too small for agricultural purposes. Since 1866 the country has been inhabited mostly by a community of Bastards, who crossed over from the Colony, and established themselves there, adopting certain regulations for their own government, which answered the purpose intended very well. Many colonists of European descent have recently settled down amongst them. The farms are generally 30,000 acres in extent, and some are as much as 60,000 to 70,000 acres.

One of the features of the country is the number of "pans," or

shallow lakes, which occur everywhere, the largest being the Hakscheen or Eirdop Pan (named on some maps Hog's-skin Vley). An extraordinary strong fall of rain is required to raise the water in the pan for a few inches, and, as a rule, the large surface exposed to sun and wind causes it to evaporate in a few days. In some of the smaller ones the water is sufficiently fresh to be used for drinking purposes; but the greater number are full of saline matter, and some are poisonous both for man and beast.

Seven miles north of Mier or Reitfontein the hard ground ceases, and the high sand dunes of the desert extend for fully one hundred miles. They are from 100 to 300 feet high, and at distances of from 200 to 300 yards apart. There is an absence of any gullies or ditches, showing that water seldom or never runs there, the sand being so porous as to absorb every drop as it touches the ground. These dunes are thickly covered with grass, and occasionally a shady tree invites the traveller to rest. The region northwards gradually loses its undulating appearance, and becomes a level, sandy plain, covered with clumps of camel-thorn and other trees. It is destitute of water, but after good seasons the tsoma, or wild melon, abounds, and serves the purpose of food and drink. Hunting parties are then organised, and for months the natives live on these melons and the game they kill. Formerly game was plentiful; but it is gradually getting exterminated, and hunting is no longer the remunerative occupation it once was. It is, moreover, dangerous, for in dry seasons, or in localities where the tsoma does not grow, persons engaged in such expeditions are liable to endure fearful suffering and privation.

In the adjoining German Protectorate, the difficulties of transport over the sandy wastes and stony tracts of Great Namaqualand have been overcome by the use of dromedaries. They are stated to be equally efficient in the driest, as well as the moistest climate; they are unaffected by the diseases of cattle and horse-sickness; and in resistance of hunger and thirst they even excel the Damara ox—in one instance going for six days without water, and, on arrival at their destination on the seventh day, showing no particular greed for it. Their speed with a load of 250 lbs. is about that of an ox-wagon, and this they continuously maintain. For traversing and exploring the Kalahari they are likely to prove most serviceable.

CHAPTER XXIV.

MASHONALAND AND THE BRITISH SOUTH AFRICA
COMPANY'S TERRITORIES.

THE present century, shortly after its birth, witnessed the occupation of the then scant territory of the Cape of Good Hope by Great Britain. Now, ere its close, it has seen the British sphere of influence and enterprise expand and extend until nearly a million square miles of the most healthy and habitable portions of South and Central Africa are embraced within its dominion.

This expansion has to a large extent been accomplished within the past half-a-dozen years. In previous pages, it has been shown how tardily and reluctantly the advance of colonisation in South Africa received any sanction from the Imperial authorities. From time to time scattered numbers of Europeans spread out into the interior, but no bold attempt to establish civilisation and extend commerce beyond the colonial borders was made by the British administration, mainly from a timid apprehension that it would indefinitely enlarge its responsibilities. It was only when some of the European powers developed colonial aspirations, and proceeded to partition Africa, that Britain awoke from its apathy, and realised the importance of securing, before it was too late, a portion of the regions which other countries were rapidly appropriating.

The extension of sovereignty over British Bechuanaland and the country northward to the Zambesi in 1885, was the first active step taken. It was followed in 1888, by a treaty of peace and amity being concluded with Lobengula, king of Matabeleland, under which the latter agreed to refrain from entering into any correspondence or treaty with foreign powers without the sanction of Her Majesty's High Commissioner for South Africa. Shortly after this, representatives of influential syndicates were sent, with the knowledge of the government, to negotiate with Lobengula for the exploitation, mining, and working of minerals in his country; and the result was that a concession was granted by the chief to Mr. C. D. Rudd and others, in consideration of the monthly payment of one hundred sovereigns to himself, his heirs and his successors, the delivery of 1,000 Martini breech-loading

rifles and ammunition, and the placing of a steamboat with guns suitable for defensive purposes on the Zambesi River. This concession, with regard to metals and minerals, was subsequently added to by the acquirement of rights as to the disposal of vacant lands, with due regard to native rights.

In 1889, the Hon. Mr. Cecil Rhodes and other founders of the British South Africa Company, who held the concession granted by Lobengula, applied to Her Majesty's Government for the incorporation of the Company under Royal Charter, for working the mineral and other concessions, extending railways and telegraphs in the direction of the Zambesi, encouraging emigration and colonisation, and promoting trade and commerce. The Imperial Government received the proposal with favour, as the new Company would to some considerable extent relieve them from the diplomatic difficulties and heavy expenditure incidental to the creation of administrative operations in the country, while at the same time, it would be under the control of the Secretary of State. The charter was accordingly granted, giving the Company powers of government in the country lying to the north of British Bechuanaland, to the west and north of the South African Republic, and to the west of the Portuguese dominions, and it provided for a deed of settlement approved by the Lords of the Privy Council, defining the objects of the Company and embodying regulations for the conduct of its affairs.

No time was lost in occupying and opening up the country. Lobengula had advised that the eastern portion of his dominions, known as Mashonaland, which had been explored for gold by Mauch, Baines, and other travellers, should be first developed. It was determined this should be done, and a route was planned through a roadless country from Bechuanaland across the Shashie, Nuanetzi, and Lundi Rivers, to the eastern plateau, thus avoiding contact with the kraals of the Matabele, and the possibility of exciting their hostility. A contract was entered into with Major Frank Johnson, with whom were associated Mr. F. C. Selous, Mr. Heaney and Mr. Borrow, to organise a pioneer expedition of about 200 Europeans and 150 native labourers to reach the objective point, a high eminence on the plateau, which Mr. Selous had named Mount Hampden. This force, composed of English and Afrikaner volunteers, was accompanied by several prospecting parties and 500 mounted police, equipped with arms, mountain guns, electric light, and other appliances of modern civilisation, the whole being commanded by Col. Pennefather, of the Inniskilling Dragoons. After a march of 1,000 miles, fording rivers and cutting their path through bush and forest, on the 12th September, 1890, they reached their destination, where now is the

town of Salisbury, without a single shot being fired or the loss of a single life. On examination of the country, it was found that the greater portion of it was well adapted for colonisation. A large section of it lay at an elevation of 4,000 to 5,000 feet above sea-level. It was well watered and well timbered, and in the summer months the rainfall was plentiful. For two-thirds of the year, the atmosphere was dry and invigorating, and though within the tropics, the temperature was found to be a temperate one, ranging from 36 to 86 degrees. The native inhabitants, chiefly belonging to the tribes named the Makalakas and Bunyai, but generally known as Mashonas, proved a peaceful, tractable people. Most of them occupied the fastnesses of the hills and mountains, in constant apprehension of raids from the Matabele, which the occupation of the country has now put a stop to.

The machinery for the administration of this new possession was soon organised, and Mr. A. R. Colquhoun assumed the office of administrator on behalf of the Company. In terms of their contract the pioneers were disbanded, and they dispersed in every direction to seek for gold. The summer rains set in after January and February, 1891, and were exceptionally severe and protracted. The prospectors at work in the low valleys and woodlands (the least healthy part of the country in summer) contracted malarial fever. The hut accommodation they had was of a poor and temporary description, and suitable food, clothing, and medical comforts were not too plentiful. The expeditionary force had taken with it but limited supplies, trusting to more being pushed forward later on; but the heavy rains and unfordable rivers caused an interruption of communications. Much privation and hardship were endured, and many deaths from sickness occurred. As soon as possible after the cessation of the rains communications were opened up, and large quantities of supplies sent into the country; and in the ensuing summer season the medical officer reported "good food, good clothing, shelter from inclement weather and the sun, an abundant supply of medicines and invalid necessaries, and a milder season have wrought an enormous improvement in the general health of the people, and Mashonaland of 1892 is not recognisable as the Mashonaland of 1891."

In the winter of 1891 Mr. Colquhoun, who had suffered from the climate in 1890, resigned his position, and was succeeded by Dr. L. S. Jameson, who has since continued successfully to discharge the duties of administrator and chief magistrate of the territory. His headquarters are at Salisbury, which also has been selected as the future capital. It has a population of about 500 persons. Public buildings have already been completed and occupied,

including the administrator's offices, court house, survey, mines, post, and telegraph offices, and the Standard Bank. Hotels and stores have also been erected; a newspaper, the *Rhodesia Herald*, is published weekly; and by the telegraph wire communication is open to all parts of the world. Townships have also been laid out at Umtali and Victoria. The first sale of stands at these three towns took place in July, 1892, when 264 were disposed of, realising close upon £10,000, the highest price paid being £285 at Victoria. Good buildings are in course of construction at these townships, evidencing the confidence of the people in the future of Mashonaland. For administrative purposes the territory is divided into districts, presided over by magistrates, viz., the Tuli district, Victoria district, Umtali district, and Salisbury and Hartley district. Mining commissioners and medical officers are stationed in the mining districts, and justices of the peace and field cornets in the sub-districts. Missionaries of various denominations, including representatives of the Church of England, Roman Catholic Church, the Wesleyans, Dutch Reformed Church, and the Salvation Army, have established themselves at Salisbury and other places.

From the first the energies of the white inhabitants have been directed to the search for gold and other precious metals. Alluvial was found in several places, but not in remarkably payable quantities. Attention was largely given by the prospectors to the old reef workings found throughout the country, the origin of which is attributed to the ancient gold-seekers of the Monomotapa kingdom, existing centuries ago; but, in addition, new reefs, hitherto unworked, on entirely fresh ground, were found and located. The extent of gold-bearing formation so far discovered, and upon which active development is now taking place, is estimated as follows:—

Victoria District, covering an area of 70 miles long by 20 broad.					
Manica District	"	50	"	14	"
*Hartley Hill District	"	40	"	30	"
Mazoe District	"	40	"	30	"
Lo Moghunda's District	"	30	"	25	"

And recently discoveries have been made within fifteen miles of the township of Salisbury. This shows that Mashonaland is a

* Hartley Hill is named after an English elephant-hunter, Mr. Hartley, who, in 1867, while hunting in the district, discovered gold in a singular manner. Having shot an elephant, he was proceeding to take out its tusks, when he found that the huge beast in falling had ploughed up the surface of a quartz reef with its ivory, and gold was glittering in the fragments of the rock strewn around.

country with reefs in all directions, bearing gold of more or less richness. Silver, tin, copper, iron, and other minerals have been met with.

The total number of gold-bearing claims registered in 1892 was over 15,000. This indicates that an extent of ground equivalent to a continuous stretch of 400 miles has been discovered, and that the reefs are considered sufficiently promising to warrant registration of claims. On 2,000 of these claims, representing a length of about sixty miles, the shafts required by the Mining Regulations have been sunk—another proof of the confidence of prospectors in the value of their properties. Reefs have been tested at depths of between 200 feet and 300 feet below the surface, proving their permanence, and, as a rule, the reefs at the lower depths maintain the yield obtained on the surface, and in some cases give even higher results. In other cases, where it was at one time feared that the “ancient workings” had exhausted the gold, it is proved that the richness of the reefs continues far below the depths which had been attained by the previous workings. Some small batteries have been erected on a few of the properties, and the gold won by them up to the end of October, 1892, amounted to 1,905 ounces. Most of the crushings which took place ranged from 13 dwts. up to three or four ounces, and one or two were as high as ten and seventeen ounces.

For the rapid development of the gold industry, means of transport for mining machinery by the east coast route has been found necessary, and to accelerate this a section of the Beira railway (two feet gauge) over a distance of seventy-five miles, from Nevis Fereira to Chimoya's, has been constructed, and is now completed. This will suffice for the present to carry the traffic through the tract of “fly-country” to a point where a good transport road has lately been finished to Salisbury. Not only will it accelerate communication, but it will reduce the cost of transport of machinery and supplies to a figure corresponding to that at which the mining centre of Witwatersrand is served.

A complete telegraph system has been established between the Cape Colony and the principal stations up to Salisbury; and it is now being extended by the Trans-Continental Telegraph Company from Salisbury as far as Zomba, Nyassaland, whence it will be carried on to Uganda, and ultimately form a connection between Cape Town and Cairo.

Although the search for gold has occupied the chief attention, the pastoral and agricultural prospects have been carefully examined, and favourable reports submitted of them. A Commission of South African farmers, who visited the country in order to judge of its capabilities, expressed a good opinion of it. A

tract of 40,000 square miles which they examined was found by them to be well fitted for occupation by colonists. The low lands from the Limpopo to Fort Victoria (averaging about 2,500 feet above sea-level) they regarded as unhealthy and unsuitable, except for cattle-grazing in winter. But the lands from Victoria to Salisbury (3,600 to 5,000 feet) and north to the Umvokwe Mountains, as well as east to Umtali, they reported to be a healthy region, with natural capabilities for stock-farming and agriculture. Everywhere they found traces of agriculture on an extended scale of former ages, when a considerable population must have dwelt in the land.

Besides that part of Mashonaland which the Commission travelled over, Mr. Colquhoun, the late administrator, says other portions will be found profitable for agriculture. The soil is, generally speaking, rich and fertile, and owing to the facilities for irrigation large areas could be put under cultivation, and quantities of wheat grown to supply the future centre of the mining population. From English seeds taken in by the pioneers, very fine vegetables were produced, and in addition to the maize, millet, rice, and beans now cultivated by the natives, all the fruits and vegetables of northern Europe can be produced. A feature of its pastures deserves notice. When the long summer grass is burnt off—usually in June to August—there springs up a short, sweet herbage, on which cattle and horses thrive. Thus, during the months of September and October, when Bechuanaland and the South African Republic are a scorched, arid waste, and cattle poor and miserable, the Mashonaland valleys are everywhere green, streams run through each hollow, and stock are in splendid condition. Attracted by such favourable reports, farms are being taken up by colonists from the adjacent States, and elsewhere, and the agricultural occupation of the country is steadily proceeding.

The conditions under which the Company at present grant land to settlers, are the payment of an annual quit-rent in advance of £3 per 1,500 morgen (3,000 acres) and 4s. for every additional hundred of morgen or portion thereof; no single grant to exceed 3,000 morgen (6,000 acres). The grantee has to occupy the land within five months, and to continue in occupation by himself or by an approved substitute.

The Company's operations are not limited to Mashonaland. With the sanction of Her Majesty's Government they include the whole of the British sphere north of the Zambesi, except Nyassaland, which is under the control of an Imperial Commissioner. In 1889 Mr. Rhodes equipped and despatched a mission, under Mr. Lochner, to Lialue, the chief town of Lewanika, chief of the Borotse, whose territory extends from the Portuguese province of

Angola over about 225,000 square miles. He also sent a mission under the leadership of the African traveller, Mr. Joseph Thomson, to the chiefs north of the Zambesi, between the Barotse and the settlers in Nyassaland; and another, under Dr. Jameson, to the Gaza chief Gunghuyana. As the results of these missions, friendly relations were established with the different tribes, and several valuable concessions, securing trading and mineral rights, as well as considerable tracts of land, have been obtained.

The total extent of territory within the sphere of the British South Africa Company, south and north of the Zambesi, is estimated at about 750,000 square miles, an area exceeding that of France, Germany, Austria, and Italy combined. It has the right to all minerals over nearly the whole of this extent, and it has obtained surface rights as well over the most valuable parts. Its policy has been to secure as fields for future enterprise the high table-lands extending not only through Matabeleland and Mashonaland, but northwards beyond the Zambesi up to the confines of the Congo Free State. These plateau lands, at an elevation of nearly 4,000 feet, are reported to be suited for habitation by Europeans, and in regard to elevation, climate, soil, and water well adapted for pastoral and agricultural purposes. The geology of the regions north of the Zambesi is described as closely identical with that of Mashonaland—giving striking indications of mineral wealth.

A matter of world-wide archæologic interest was opened to research by the occupation of Mashonaland. Throughout a considerable tract of country, westward of the Sabi River, extensive ruins of well-built stone erections were found, the largest and most perfect being those of Zimbabwe,* in S. lat. 20° 16' 30", and E. long. 31° 10' 10", about twelve miles from Fort Victoria. They consist of a combined fortress and temple on a granite hill, and other buildings of elliptic shape on the adjacent plains, with walls from sixteen to thirty-five feet high, enclosing large and small stone towers, and a mass of crumbled ruins spread out in their vicinity. The earliest record of the existence of these remains dates back to the beginning of the sixteenth century. The Arabs, whom the Portuguese discoverers found at Sofala in 1505, reported that there were in the interior remarkable buildings, and a high tower, constructed of masonry without mortar, but by whom they had been erected was unknown to the natives or themselves. The Portuguese occupation of the country being confined to the coast and the lands along the course of the

* The natives now living at the ruins pronounce it *Zimbabwe* (the "g" having a deep guttural sound), and in the Tshikaranga language, spoken by them, the word means the "houses of stone."

Zambesi River, no attempt was made to verify the truth of the Arab report, and the ruins remained unvisited and unnoticed for over three centuries. Mr. Carl Mauch, the German explorer, was the first white man to discover them, while on his journey of exploration, in 1871, between the Limpopo and Zambesi Rivers. No European followed upon his footsteps until 1889, when two young colonists, W. and H. Poselt, reached them, and in the following year the Rev. Mr. Helm, of the Dutch Reformed Church, commenced a mission work among the natives, under the chief Mokabi, living on the rocky eminences where the ruins are. Several of the members of the Chartered Company's pioneers then explored them, and in 1891, under the auspices of the Company, as well as of the Royal Geographical, and the British Society for the Advancement of Science, Mr. Theodore Bent, accompanied by Mrs. Bent and Mr. R. Swan, visited them for the purposes of scientific investigation, the results of which have been published in Mr. Bent's volume on 'The Ruins of Mashonaland.'

These show that the Zimbabwe ruins have an antiquity of origin far beyond the possible operation of any native civilisation, or of European enterprise in Africa. The circular building was found to be a unique specimen of an ancient phallic temple, and the round stone towers and numerous finds of emblems of similar symbolic character clearly indicate its religious purport. The hill fortress, approached by a narrow, steep ascent, was adorned with monoliths, small round towers, and pedestals of steatitic rock, some of the latter decorated with carved figures of birds, of the raven, hawk, or vulture form, sacred to the gods they symbolised. Here were found fragments of steatite bowls, with different animals, the human figure, and other ornamentations carved upon them, and a quern-shaped stone, studded on one side with knobs common in phallic decorations. Besides these there were several pieces of pottery, native implements, bits of Persian and Celadon ware and glass, an ingot mould, and small crucibles, which had been used for the smelting of gold by the gold-workers of ancient times. Measurements taken by Mr. Swan further disclosed that the builders of the temple constructed it on a carefully-designed geometric plan, and that it was oriented for the observation of the stars of the northern hemisphere. The encircling wall when first looked at seemed to be built on an irregular ellipse, but it was found to be formed of a series of curves with radii of different lengths; and it was discovered that the proportion of the towers—which are the principal religious symbols—embodied the proportions of the whole structure. The common cubit (representing the length of the fore-arm) was found to be the unit of measure, and the circumference of the little tower was exactly equal to the

cubit diameter of the great one. This diameter, multiplied by the ratio of the circumference of a circle to its diameter, or by its square or cube, gave either the radius or the diameter, or halves thereof, of the curves of every wall of these ancient buildings. Similar curves with radii also determined the contour of both the towers, and enabled them to be restored, when their heights measured $13\frac{1}{2}$ and $42\frac{1}{2}$ feet respectively. Further examination and excavation of the ruins were carried on in 1892 by Sir John Willoughby, resulting in discoveries which point to the occupation of Zimbabwe by successive peoples following after its original builders. The interesting relics recovered from the ruins both by the Messrs. Poselt and Mr. Bent have been presented by the Hon. Mr. Cecil Rhodes to the South African Museum, where they form an interesting and valuable collection.

All the knowledge gathered up to date respecting the builders of Zimbabwe point to their being of Sabaeans or Phoenician origin in the unchronicled centuries long before the Christian era. The Sabaeans, inhabiting South Arabia, were the earliest maritime people who carried on the interchange of the commodities of East and West. Their kinsmen, the Phoenicians, joined with them in their operations, and Sheba of Yemen was the emporium of their trade. Biblical testimony, in the writings of Isaiah, Jeremiah, and Ezekiel, shows the wide range of their commerce at the period of the reign of King Solomon (1000 B.C.); and Assyrian inscriptions record that it extended as far north as Nineveh, while southward it spread to Egypt, Abyssinia, and the east coast of Africa.

Among those Semitic races there was a community of religious ceremonies and ideas, which took the form of a gross pantheistical deification of the forces of nature; and Solomon, the wisest of men, it is mentioned, was so far beguiled by his wives in his old age as to worship at their altars. The archaic monuments left by them in parts of Arabia have the same style of construction as Zimbabwe, their chief temples being of elliptic form, fortress and temple being often combined, while associated with them are stone towers and objects of rude art symbolic of the primitive cult. And it is noticeable that, as in the case of the Zimbabwe ruins, the native inhabitants living around these erections in the present day can tell nothing of their origin or history beyond that they were built by the "ancient people."

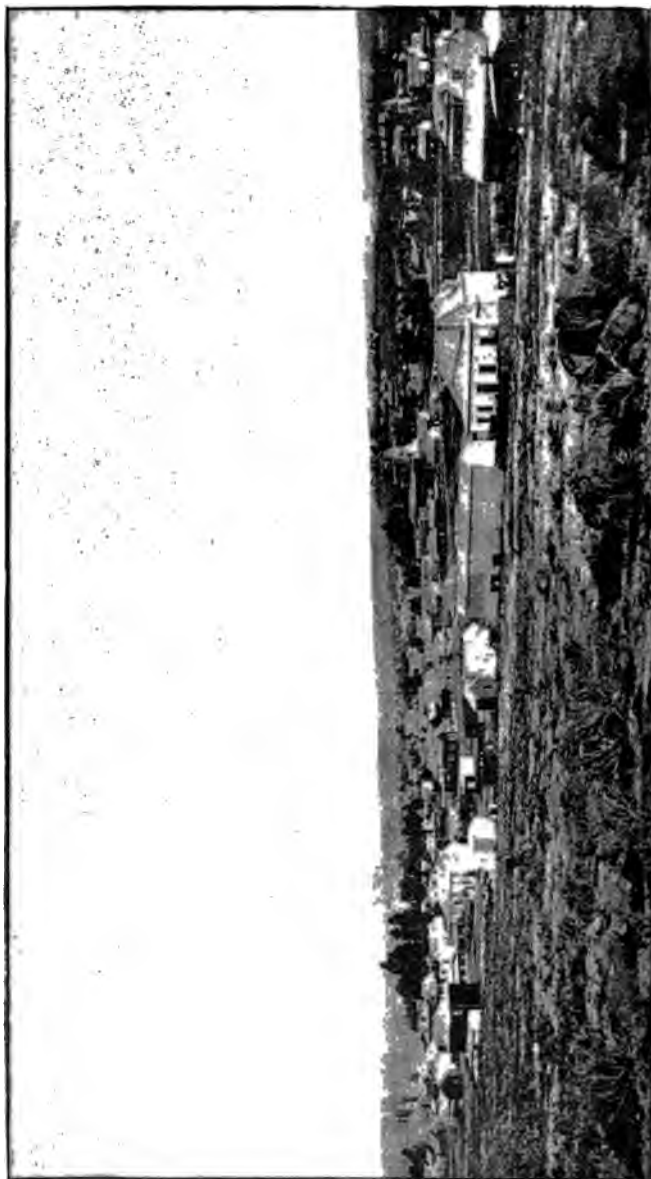
The wealth of gold among the Sabaeans was shown by the incident of the overland journey of their Queen to King Solomon's court, when she took with her, besides spices and precious stones, no less than 120 talents of gold, nearly equal to one-third of the whole quantity (420 talents) brought home by the Tyro-Israelitish

fleet from Ophir. That the gold-producing region of Ophir was the "red land" of East Africa, now known as Mashonaland, where the Sabi River flows, there is little doubt. Nearly a hundred years ago, the traveller Bruce fixed upon this country as the only locality corresponding to Ophir which could have furnished the quantity of gold supplied to Arabia in remote times; and he proved by the laws of the monsoons that the return voyage of Solomon's expedition from Ezion-geber to Sofala would occupy exactly the three years which was assigned to it. The Greek author of the 'Periplus of the Erythrean Sea,' who wrote in the first century of the Christian era, tells us that the east coast of Africa was then in the possession of Kharibel, king of the Himayarite-Sabaeans, "through ancient right;" and the Egyptian fleets which were sent out by the merchants of Alexandria found the vessels trading there had Arabian commanders acquainted with the country, who had contracted marriages with the natives, and could speak their language.

As to the events which led to the decay of the active trade and great wealth of the Sabaeans, history is silent, except a tradition that after bursting of an immense dam, that of the Marib, entailing national calamity, there was an emigration of the Yemen people northwards, and the country subsequently was ruled by Persian conquerors. Regarding the fate of the Sabaeans or Phoenician colonists who built Zimbabwe, there is no record whatever. It may be that in the successive surges of barbarism, which swept over the land, they were attacked by the natives of the country, who supplanted them, and under the designation of the "Monomatapa" (the men of the mines) carried on the gold workings. Those of the Arabs, who knew the secret, which the Sabaeans and Phoenicians had jealously concealed, of *Sofala 't il Dhab* (the low land of gold) continued on the East African coast, and when the Portuguese, at the close of the fifteenth century, sailed into the Indian Ocean, they found them in possession of the ports and islands from Sofala to Melinde. There the Arabs of India and the Red Sea trafficked with them, receiving virgin gold in exchange for their Eastern commodities. The Portuguese soon wrested some of these ports from the Arabs, and levied tribute from the Moslem Sheiks who ruled the others, the chief of Melinde contributing 1,500 ingots of the gold he got from Sofala yearly. Later on, Portuguese sovereignty was established all along the coast; but after Portugal came under the Crown of Spain, its power and influence began to wane; Kafirs in the south and Arabs in the north attacked and occupied portions of its possessions, until it had to be content with limiting its dominion in East Africa to the seaboard and the course of the Lower Zambesi.

By the Anglo-Portuguese Convention of June, 1891, the navigation of the Zambesi, its branches and its outlets, have been declared open for the ships of all nations; and there is absolute freedom of communication between Pungwe Bay and the British sphere of influence in Mashonaland.

Mr. H. H. Johnston, C.B., is the Imperial Commissioner for Nyassaland, and has taken up his residence at Zomba, a central place on the Shire highlands, where he is supported by an Indian police force; he is also permitted by the Government to act as administrator of the British South Africa Company's operations north of the Zambesi, the Company contributing £10,000 a year towards the expenses of the administration. British gunboats have now been placed on the Shire River and Lake Nyassa, and much is being done by the Imperial Commissioner and those associated with him, towards the suppression of the slave and guns and powder trade, and the peaceful government of the natives in that region. The African Lakes Company, and the missionaries at Blantyre, Bandawa, Ngenenge, and Likoma are assisting in the development of the country, and on the Shire Highlands, where some Europeans have settled, coffee plantations have been remarkably successful.



[To face page 441.]

BLOEMFONTEIN

CHAPTER XXV.

THE ORANGE FREE STATE.

THIS State, which forms one of the two independent republics of South Africa, is bounded on the south by the Orange River, dividing it from the Cape Colony ; on the north by the Vaal River, separating it from the South African Republic ; on the east by Basutoland and the Drakensbergen, dividing it from the Colony of Natal, and on the west by that portion of the Cape Colony known as Griqualand West, or the Diamond Fields.

At the commencement of the century, this part of South Africa was inhabited chiefly by Bushmen, Korannas and Bechuanas. With the former of these aboriginal tribes the right of occupation was only co-extensive with the power of the occupiers to retain it. Land abandoned by one tribe or people was taken possession of by another, and the latter occupied it until they moved off elsewhere, or were dispossessed by a more powerful neighbour. A horde of mixed or half-bred Hottentots, named Griquas, who wandered forth from the north-west portion of the Cape Colony in search of new pastures, found lands unoccupied north of the Orange River and settled there. They nominally acknowledged as their chiefs or captains, certain Bastard hunters, named Barends and Adam and Cornelius Kok, and subsequently another named Waterboer. Missionaries who had originally found the people a set of naked, painted, thievish savages, remained with them, and gradually induced many of them to abandon their savage raiding life and adopt habits of industry. They settled down in villages and began to make some advance in civilization : trading with the colonists, and exchanging their native produce for clothing, household necessities, gunpowder, firearms and brandy. Some of them, however, reverted to their old plundering violent life, and joined by Korannas and other natives, formed lawless marauding bands, who were designated the Bergenaars. Armed with guns, the neighbouring Bushmen and Bechuanas alike became their victims. Against the Bushmen, they carried on a war of extermination, and the Bechuanas were incessantly plundered of their stock, many of them murdered, and others reduced to want and misery. Pringle's pathetic poem of the

"Bechuana boy" gives a recital of the heartrending sufferings inflicted by them.

"I sat at noontide in my tent,
And looked across the desert dun,
Beneath the cloudless firmament
Far gleaming in the sun,
When from the bosom of the waste
A swarthy stripling came in haste,
With foot unshod and naked limb,
And a tame springbok following him.

"With open aspect, frank yet bland,
And with a modest mien he stood
Caressing with a gentle hand
That beast of gentle brood;
Then meekly gazing in my face,
Said, in the language of his race,
With smiling look yet pensive tone,
'Stranger—I'm in the world alone!'

"'Poor boy!' I said, 'thy native home
Lies far beyond the Stormberg blue:
Why hast thou left it, boy, to roam
This desolate Karoo?'
His face grew sadder while I spoke;
The smile forsook it; and he broke
Short silence with a sob-like sigh,
And told his hapless history.

"'I have no home!' replied the boy:
'The Bergenaars—by night they came,
And raised their wolvisb howl of joy,
While o'er our huts the flame
Resistless rushed; and, aye, their yell
Pealed louder as our warriors fell
In helpless heaps beneath their shot:
One living man they left us not.'"

About 1820, many farmers from the Cape Colony, seeking better pastures for their flocks to the north of the Orange River, appeared in the country for a few months each year. Their numbers increased annually; but it was not until 1828 that any permanently remained. They found the central portion of the territory uninhabited and settled there, coming gradually into contact with the Basutos on the east and Griquas on the west, and had no difficulty afterwards in purchasing tracts of land at nominal prices. These pioneers were followed in 1835-6 by large bodies of the Boer emigrants, who left the Colony in order to put themselves beyond British control. Some of them settled in the country, and organised a crude form of government under the name of the "Maatschappy" (or company), and established their headquarters at Winburg.

It was not long before they came into collision with the Griquas, who appealed to and claimed protection from the Government of the Colony, with whom they were allied by treaty. The British Governor, Sir P. Maitland, intervened in 1845, assisting the Griquas with troops, who dispersed the Boers at Zwart Koppies; and to prevent further disturbances, a British Resident was appointed to adjudicate in all causes of dispute between the native communities and the Europeans, who then numbered about 2,000. In 1848, Governor Sir H. Smith visited the territory, and came to the conclusion that peace could not be maintained among the mixed elements forming the population without the establishment of a regular government. He therefore issued a proclamation, afterwards confirmed by the Crown, annexing the territory to the Empire under the name of the Orange River British Sovereignty. He intimated that he was moved to take the step by a desire to establish an amicable relationship with the native chiefs, to uphold them in their hereditary rights and protect them from aggression, and simultaneously to provide for the peace and good government of those emigrant subjects who had located themselves amongst them.

Seats of magistracy were established at Bloemfontein, and other places, and steps were taken for organising a permanent government in the country. This created an agitation amongst a number of the emigrants who were averse to British rule. They assembled in arms, chose as their leader Mr. Andries Pretorius, who had then left Natal to cross the Vaal River, and made a demonstration to compel the British officials to withdraw. They appeared before Bloemfontein and demanded that the Resident with the troops and inhabitants there should evacuate the place. The civil functionaries at Winburg and Caledon River were required to do the same. In the presence of overpowering numbers they deemed it prudent to comply, and were accompanied by those of the inhabitants who refused to take part in the rebellion. The Governor, Sir H. Smith, on receiving the news immediately collected a strong military force, with which he crossed the Orange River, in August, 1848, and met the Boer Commando at a spot near Boomplaats. Here the Commando were defeated and dispersed, and British authority was re-established and afterwards maintained in the country until towards the close of 1853. The Imperial Government, however, at this period realised that it was hopeless to permanently settle the incessant broils in the territory without a large armed force and a considerable expenditure of money, and determined to get rid of what appeared to be a troublesome and costly possession. Sir George Clerk was sent out as a Special

Commissioner with instructions to carry out the abandonment of the country north of the Orange River; and notwithstanding the protests of the inhabitants, many of whom had taken up their abode there under the assurance of the maintenance of British Sovereignty, he made over the government to a body of delegates representing the various rural districts. This was effected by a convention signed at Bloemfontein, on the 23rd February, 1854, by which the Orange River Territory became a free and independent state.

The principal clauses of this agreement, known as the "Convention of Bloemfontein," stipulated that the inhabitants were thenceforth absolved from their allegiance to the English Crown; that the British Government would have no further alliances with native chiefs living to the north of the Orange River (excepting with the Griqua chief, Adam Kok); and that the new government would guarantee the rights of property and the legal and personal liberties of all British subjects then resident in the country. It also provided for the mutual extradition of criminals, the establishment of courts of law; that slavery (as heretofore) should not be permitted; and that the government of the territory should have at all times the right of purchasing ammunition in any Colony in South Africa.

On the 10th of April, 1854, a Constitution was adopted by the Volksraad of the new State. It was based upon that of the United States of North America in so far as that instrument was applicable to the condition and circumstances of the people. The principal provisions were: that any white man who had lived in the country six months previous to the 10th of April, 1854, should be deemed a citizen, with the right of voting for a State President or a member of the "Volksraad." This Volksraad, or Legislature, consisting of one House or Chamber, vested with the highest legislative powers, was to be made up of one member for each ward, and one member for each district town, to be elected by the burghers entitled to vote. A President elected for five years by all enfranchised burghers was to be the responsible head of the executive, and he was to be assisted and advised in the fulfilment of his duties by an Executive Council, consisting of the Landdrost (or magistrate) of Bloemfontein (the capital), the Government Secretary, and two unofficial members, to be elected by the Volksraad. The Roman-Dutch law was to be the common-law, and, in the absence of special legislation, the courts of law were to decide all cases according to its prescripts. The law was to be equally administered without respect of persons, and the rights of property, personal freedom, and the liberty of the Press were guaranteed by the Constitution. This funda-

mental law could only be amended or repealed by the consent of three-fourths of the Legislature in two consecutive annual sessions of that body.

On the 9th of March, 1866, and on the 8th of May, 1879, the Constitution of 1854 was revised, and re-enacted; but the main features of the original Constitution as above described have remained unaltered.

From the year 1854 up to the present time—a period of thirty-nine years—the Orange Free State has maintained its republican form of government, and has during that time had five Presidents, viz., Josias Philippus Hoffman, from the 15th September, 1854, to the 10th of February, 1855; Jacobus Nicolaas Boshoff, from the 27th August, 1855, to the 6th September, 1859; Marthinus Wessel Pretorius, from the 19th February, 1860, to the 17th February, 1863; Johannes Hendrikus Brand, who was re-elected five times consecutively, from the 2nd February, 1864, to the 14th July, 1888; and Francis William Reitz, who took the oaths on the 10th January, 1889.

For some time after its creation into a separate State, the Government of the Republic was engaged in meeting the difficulties arising out of territorial troubles. They had been left to settle between themselves and their native neighbours all the matters of dispute which had originated during the period of British sovereignty, and which should have been adjusted before it was withdrawn. The position of the Griquas was one of these. According to the Bloemfontein Convention, the treaty between



PRESIDENT REITZ.

Adam Kok and the British Government was still in force, and the Griqua chief claimed independence within his territory. The Orange River Government, on the other hand, contended that the sovereignty was ceded to them. Many of the Griquas disposed of their lands to Europeans, and this gave rise to complications, for the lands thus sold came under the control of the State. As a solution of the troubles which threatened to disturb the peace, it was suggested that those Griquas who still held farms should sell them, and move to some other parts. Sir George Grey, the High Commissioner of South Africa, who was appealed to by the Griquas, favoured the proposal, and promised a suitable tract of country for them on the eastern side of the Drakensberg. To this territory, then known as Nomansland, but now termed

Griqualand East, Adam Kok and the Griquas ultimately moved in 1860.

The State, however, had a more formidable difficulty to encounter in settling the boundary line with the Basutos. Under the proclamation of Sir H. Smith, the chief Moshesh had agreed to a boundary laid down by the British Resident, Major Warden, in 1849, in accordance with the plan of "leaving the white man where he was found, and the black man where he was found;" but when the sovereignty was abandoned, the Basutos considered that things had reverted to their original state, as before Sir H. Smith's proclamation. Bands of them scoured the country hunting game, declaring they were the rightful owners of the soil, and utterly disregarding the "Vagrancy Law" of the State, which required natives to be provided with "passes" or certificates from a magistrate, missionary, or justice of the peace. This led to collisions, which culminated in war between the burghers of the Republic and the Basutos. The State, soon exhausted with the strife, applied in 1851 to Sir George Grey to mediate. Willing to promote peace,

he accepted the position, and visited the disputed territory. He then gave his award in favour of the boundary-line claimed by the Free State, which he personally pointed out to both parties, and which they agreed to respect. This condition, however, was not fulfilled by the Basutos, who raided the border, and committed depredations on the Free State farmers.



PRESIDENT BRAND.

In 1863, a new President was elected. Mr. J. H. Brand, one of the leading barristers of the Supreme Court of the Cape Colony, and eldest son of Sir C. J. Brand, Speaker of the House of Assembly, was

appealed to by the burghers of the State to come and help them in their difficulties; and, at considerable sacrifice, in a patriotic

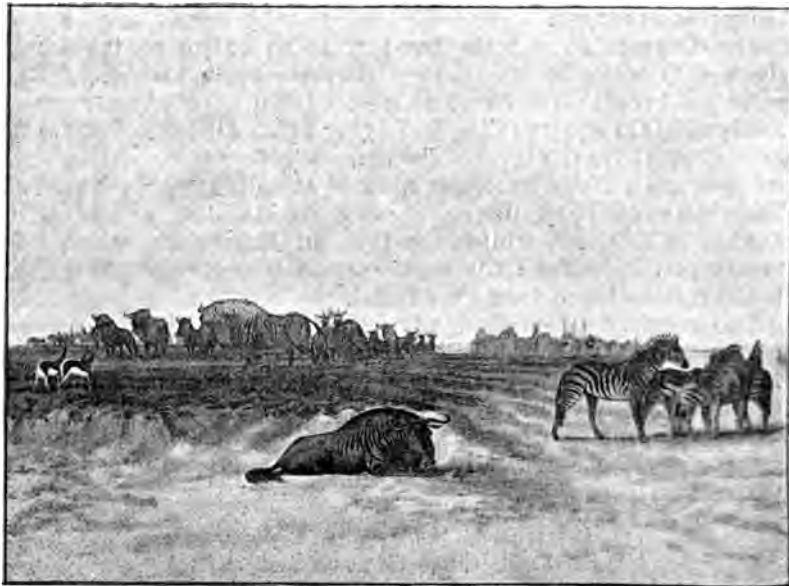
spirit he complied with their call. His first endeavours, after entering upon office in 1864, were directed to the settlement of the Basuto boundary matter. He succeeded in getting the High Commissioner, Sir Philip Wodehouse, to arbitrate and define the boundary line; and the result of this arbitration, like that of Sir George Grey's, was in favour of the Republic. Notwithstanding this peaceful arrangement of the dispute, the Basutos recommenced thieving and pillaging, so that in 1865 the State was forced to take up arms, and after eleven months' warfare, Moshesh had to sue for peace, and signed a treaty ceding a large tract of country to the conquerors. The following year, however, the murder of a trader and a farmer by Basutos in the annexed territory led to a renewal of hostilities, which were continued until towards the end of 1868. The country was nearly prostrated from this struggle. The inhabitants were both soldiers and tax-payers, and had, moreover, to supply whatever was required for the transport of the commandoes. The interests of trade and agricultural and pastoral pursuits could not receive the necessary attention, and the powers of production were proportionately lessened. Martial law was proclaimed. The procedure of the civil courts was suspended. The revenue was exhausted, and a paper currency of £130,000 had to be forced into circulation to provide the sinews of war. The Basutos, on the other hand, were pressed at every point and threatened with annihilation. Just as the Free State had thoroughly subdued them, Sir Philip Wodehouse, as High Commissioner, proclaimed them British subjects, and extended the Queen's Sovereignty over Basutoland, thus putting an end to the war.

The Republic protested against the act of the High Commissioner as a violation of the Convention of 1854, but the protest was ineffectual; and ultimately terms of peace and a definite boundary line along the Basuto Border were agreed to between the President and the High Commissioner in terms of a Convention signed at Aliwal North, on 12th March, 1869.

At this period, another question of disputed boundary arose, on the western border of the Free State. The existence of diamonds there was suddenly discovered, and the trackless plains, which appeared to Sir G. Clerk no little better than a "howling wilderness," proved to be a glittering Golconda, attracting thousands of diggers from all parts of the world. The lands where the diamond mines were situate, had for years formed a part of the State, and some of the farms were owned by burghers, on certificates issued by the British Resident during the time of the Sovereignty. The Republic sent its officers to exercise magisterial functions within the territory over which it had jurisdiction; but

blacks (Basutos and Baralongs). The number of burghers between the ages of eighteen and sixty years, liable according to law to be called out for service in time of war, is 17,381.

The revenue of the State is now £310,000 per annum, and the expenditure about the same. This revenue is derived chiefly from the following sources, viz.:—Quit rent on farms at the rate of two shillings per one hundred morgen (or two hundred acres); transfer dues on immovable or “fixed” property at the rate of 4 per cent., and on movables at the rate of 4s. per cent. on all goods sold by public auction; capitation or “hut” tax on



WILD GAME ON THE PRAIRIES.

natives, at the rate of 10s. per head or hut. To these must be added the sum of over £100,000 derived from import dues levied on all goods imported over sea, this tax being collected by the Cape Government at all Cape Colonial ports by virtue of the Customs-Convention existing between the Colony and State, and on the Natal border by Customs officers appointed by the State. The Cape Colony pays over to the Free State all import dues collected by it on goods imported through its harbours for consumption in the State, after deducting 3 per cent. to recompense itself for the cost of collection, &c.

The public expenditure is used to defray the costs connected

with the Civil, Legislative, Judicial, and Educational Departments, and for the construction of public works, such as roads, bridges, and public buildings. These public works, together with the sums devoted to education, have, during the last few years, absorbed fully one-third of the total annual income of the State.

The Government of the Republic is delegated by the people to the Legislature, the Executive and the Judicial Bench. The Volksraad consists of fifty-eight members, representing the district towns and wards, who receive an allowance of £2 per day during their absence from home. They are elected for four years, but half retire by rotation every two years, new elections occurring to fill the vacancies. The Raad elects at its yearly session a chairman from among its members, and he has a casting vote. Mr. J. G. Fraser, member for Bloemfontein, has had the honour of discharging the duties for the last twelve years.

The qualification of voters for the election of members of the Volksraad and of the President are: all burghers of full age (*a*) who are born in the State; (*b*) who have registered in their name unburthened fixed property to the value of at least £150; (*c*) who are leasees of fixed property which has an annual rental value of at least £36; (*d*) who have a fixed annual income of at least £200; (*e*) who are owners of movable property to the value of at least £300, and have resided in the State at least three years.

The President, who is the responsible head of the Executive Government, is assisted and advised by an Executive Council; and the bench of judges consists of a chief justice and two puisne judges.

The whole State is divided into nineteen districts, each presided over by a "landdrost" or magistrate, whilst each district is again sub-divided into one or more wards.

There is—since every citizen is liable to be called out as a soldier in time of war—no standing army, excepting a cadet-corps of fifty artillerymen, costing about £4,000 a year, and the State has no Public Debt, excepting a small sum of some £40,000 or £50,000, which the Government would willingly pay off, were it not that the creditors holding these debentures are unwilling to consent to their redemption, as they are by law entitled to retain them unpaid for a period of twenty years, drawing, in the meanwhile, interest at 6 per cent.

The education of the children of the State has always formed one of the chief objects the Legislature has held in view. A permanent fund, amounting to £200,000, has been set aside for this purpose. At the head of the Educational Department stands the Superintendent of Education, who is assisted by inspectors and sub-inspectors. During the school-year, 1890-91, there were in the

State(exclusive of private schools)seventy-one Government schools, with 110 teachers, and seven pupil teachers. The pupils of these schools numbered 3,000, whilst the expenditure exceeded £15,000. The Government schools are divided into town, ward, and circuit schools, and the teachers into first, second, and third class, according to certificates obtained by them from the Board of Examiners. This Board consists of nine members, appointed by the State President, and also grants certificates of proficiency in Law, Land Surveying, and in Science and Literature generally. The "Grey College" and "Dames Institute" (or Ladies' Seminary), at Bloemfontein, are as yet the only schools devoted to higher education supported by the Government. The students are only educated up to the matriculation examination of the Cape University; so that those youths who desire to carry their studies further are obliged to proceed to one of the colleges near Cape Town.

The large majority of the population are members of the Dutch Reformed Church, which community has a congregation in almost every little village of the State. This sect is supported by the State to the extent of £6,000 per annum, which amount is paid over to the Synod of the Church to dispose of as it may deem fit. The Synod meets at Bloemfontein every second year (in the month of May), and consists of the clergyman and one elder of each congregation. Also the Anglicans, Wesleyans, Lutherans, Baptists, Presbyterians, Separatist Dutch Church and Roman Catholics have churches and schools in different towns and villages. The Anglicans, under the Episcopate of the Bishop of Bloemfontein, possess many churches, and have erected, especially in the Capital, several school buildings, of which St. Andrew's College (for boys), and St. Michael's Home (for girls), are the most important.

Most of the above-named denominations also receive small grants in aid from the Government. At Witzieshoek the Dutch Reformed Church has established a Mission; at Bethany and at Mabolela (in the district of Ladybrand) and at several other stations the Berlin Mission Society has erected churches and schools, whilst the Wesleyan and Anglican churches have similar institutions in the district of Maroka and in other parts of the country.

The Statute Law has been codified by a Commission under the presidency of the Chief Justice (M. De Villiers) in a volume of 876 pages, and was in 1891 declared to be the law of the land by the Volksraad. The principal enactments contained therein are the following :—

1. For the establishment of Higher and Lower Courts of Law and for regulating their procedure. These Courts consist of:

(a) The High Court with a Chief Justice, and two puisne judges, which hears civil cases for the district of Bloemfontein as also (by consent) for other districts, and decides civil appeals and criminal revisions from the decisions of the Circuit Courts. (b) Circuit Courts for the hearing of civil and criminal cases, presided over by one judge, who is assisted by a jury of nine men in criminal trials. (c) The Courts of "Landdrost-and-Heemraden," consisting of the magistrate of each district, assisted by two assessors (elected biennially by the Volksraad) and having a limited jurisdiction in both criminal and civil cases. (d) The Landdrost-Court, over which the magistrate of the district presides with a limited jurisdiction in criminal and civil cases inferior to that of the Court of "Landdrost-and-Heemraden;" and (e) the courts of the Resident Justice of the Peace, who has limited jurisdiction inferior to that of the landdrost, in towns not being district towns, and of the Special Justices of the Peace who have power to decide cases under the Pass Law and the Masters and Servants Law, with the right to inflict small fines or corporal punishment to a limited extent. The sentences of both these subordinate courts are subject to revision by the landdrost.

2. By an enactment of 1854, the Dutch language was declared to be the official language of the State, and is used in the Volksraad and other official proceedings; but in Bloemfontein and most of the district towns English is spoken by the community generally.

3. The Commando Law regulates the calling out of the burghers in time of war, every male inhabitant between the ages of 16 and 60 being made liable to such service. In addition to this law, there are several regulating the holding of "wapen-shaws," or burgher reviews, in every district once in four years, and in every ward annually, every man between the ages of 18 and 40 being bound under a penalty to attend armed and mounted. By another law the Government provides each burgher with a rifle at cost price. And, by a law of 1889, a body of mounted police has been established consisting of about 100 men, who, under the direction of a commandant, are doing good service in the suppression of cattle-thefts, and in maintaining the proper execution of the Pass-laws.

4. The laws providing for the establishment of an Educational Department and regulating all matters concerning government schools and private schools receiving grants in aid from the public revenue.

5. The laws bearing upon Insolvency and the Orphan Chamber; the Registration of Deeds and of Trade Marks and Patents; and concerning Municipalities and Marriage, have been copied from

those of the Cape Colony and Natal, with a few unimportant alterations and additions.

6. The Liquor Law of this State, which was adopted in 1883. This has now been ten years in operation. It is peculiar as being to a certain extent a "Maine Liquor Law," for it prohibits entirely the sale of strong drink to blacks, and, moreover, permits the sale of spirituous liquors in towns only, no licenses being allowed for the sale thereof outside the limits of any town or village. These restrictions have undoubtedly tended to diminish drunkenness amongst the native and rural population, and although it cannot be denied that contraband trade in liquor has thereby been fostered, and that some inconvenience has resulted to travellers, who complain that they are unable to procure accommodation along the highways, yet on the whole it is certain that this law has had a most beneficial effect upon the character and habits of the people of the State.

The natural resources of the State are pastoral, agricultural, and mineral. Most of the country is adapted for stock and sheep runs, and the breeding of cattle, horses, mules, sheep, goats, and ostriches form the principal occupation of the people. The returns of stock, according to the census of 1890, showed the following numbers: horses, 248,878; mules and asses, 19,782; transport oxen, 276,073; other oxen, 619,026; Cape sheep, 703,381; merino sheep, 5,916,611; Angora goats, 627,617; other goats 230,538; pigs, 34,787; ostriches, 1,461. The production of wool was 59,555 bales; and that of grain (including wheat and maize), 436,069 muids, equal to 1,308,207 bushels.

Agriculture, and notably wheat-growing, is rapidly being extended in the south-eastern portion of the State, where the alluvial soil is remarkably fertile. This part is known as the "Conquered Territory," a strip of country about 100 miles long and 30 miles broad. It comprises the districts of Ladybrand, Wepener, Ficksburg, and part of the district of Bethlehem. The country is formed of a series of valleys and basins, lying at the base of the hilly spurs given off by the Maluti Mountains. It has a good rainfall, as a rule beginning in October and occurring at intervals up to the commencement of the year, when the heavy rains set in during January, February, and March. At the end of April they generally cease, and occasional frosts are experienced until the close of May, when winter commences in earnest.

The adjacent hills are sandstones and limestones, the *débris* of which is constantly washed down into the valleys and enriches them. The soils generally are black, red, or sandy, with underlying potclay and sandstone. The black soil is a rich dark loam, extremely productive when the rainfall is plentiful, but it re-

quires ample moisture. The red soil when well worked is also very good. On these wheat, oats, maize, barley, millet and other cereals grow abundantly. Fruits, such as apples, pears, peaches, apricots, plums, cherries, strawberries and grapes do very well, and if properly cultivated would rival the fruit seen in the London market. Trees, including the oak, pine, and fir, flourish, and all kinds of hardy flowers attain perfection, some being specially fine as regards size, beauty, and quality of bloom.

The average return for wheat is about 30 muids (1 muid=



HILLDALE, NEAR BLOEMFONTEIN.

3 bushels) for each one sown ; but in some places it is as high as eighty-fold. Although the present method of cultivation is very rough and unscientific, corn being sown year after year on the same ground, without any change of crop, or period of rest, the yield has so far in no way deteriorated. No manure is ever given to the soil, and the crops are seldom irrigated, the rainfall being as a rule ample. Machinery is coming every year more and more into use ; all the wheat is threshed by steam-threshers, of which there are many in the territory. Reapers and binders are also

introduced, although it cannot yet be said that the majority employ them. The want of skilled mechanics who can repair these machines when out of order, doubtless stands in the way of their general adoption.

Although corn-growing is here the main pursuit of the farmers, horses and cattle are bred in large numbers, as well as sheep, and the breed of all classes of animals has much improved during the last five or six years, owing to the introduction of superior stock from Colonial and English sources. Of the resident population, which has considerably increased of late, the majority are Dutch, but there is a goodly sprinkling of English and Scotch farmers, as also a few Germans.

The size of a conquered territory farm is about 3,000 to 3,500 acres, and few exceed this. There has been lately a great tendency to cut up the ground, and many farms now are not more than 1000 acres in extent. The value of ground may be put down at 15s. to £1 the acre for a good average farm; this price would include any buildings that may be upon it.

The production of wheat is increasing yearly, and when in due time the territory will be served by the requisite railways, and be cultivated to its full extent, it bids fair not only to be—as it already is—the granary of the Free State and the Transvaal, but also to supply breadstuffs to the rest of South Africa.

Coal is found in the north and eastern parts of the State, and the mines opened in the Kronstad and Heilbron districts have been utilised for some time.

Magnetic iron ore also occurs in the neighbourhood of the coal-beds. Natural cement and saltpetre and ochre exist in the districts of Ladybrand and Bethlehem, whilst indications of reef-gold have been discovered in the north, with improving prospects, as it is pretty definitely accepted that the southern fringe of the Witwatersrand Basin, with the banket beds, has been found cropping out within the State.

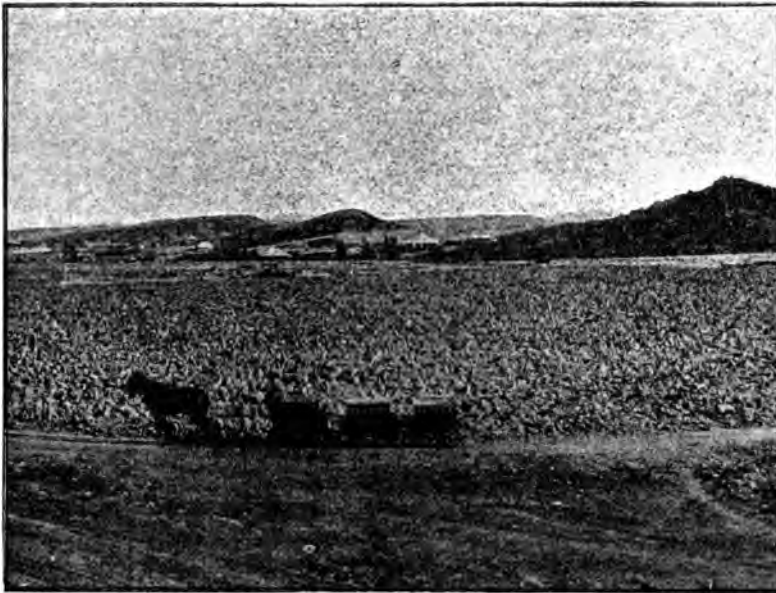
There are several salt-pans in the districts of Boshof, Fauresmith, Jacobsdal, and Bloemfontein. One of these, situated at a distance of twenty-four miles from Bloemfontein, is the most remarkable. It is called "Hagan's Pan," is about two miles in diameter, and produces salt which has been pronounced by Professor Hahn, who analysed it, to be the best in South Africa. The pan is now being worked by the "Salt & Mercantile Company," under the management of Mr. E. Lissack, and salt is exported in large quantities to Johannesburg, where it is used for the chlorination works.

Diamonds are dug to a considerable and daily increasing

amount in the mines of Jagersfontein and Koffyfontein, both situated in the district of Fauresmith.

The output of Jagersfontein in 1890-91 was 96,338 carats, worth £191,255, and in 1891-92, 112,512 carats, valued at £222,011. During the month of January, 1893, it amounted to 15,189 carats, valued at £29,451 18s. 3d., and besides this average monthly yield, a stone was unearthed weighing 427 carats, and valued at £10,000.

Koffyfontein is as yet in its infancy. Up to the month of February, 1893, only about 300 claims (of 30 feet by 30), of the



JAGERSFONTEIN MINE.

1473 claims forming the mine, have been worked upon a small scale, producing, during the month of January, 1893, only 1484 carats, valued at £2,117 10s. At the beginning of February, however, the mine inspector reported that all the claims in the mine had just been taken up, and it is understood that this mine will now be also fairly tested, and possibly, in time, give as good results as Jagersfontein.

Besides Jagersfontein and Koffyfontein, there are two mines where diamonds have been found, now in course of development. One is the "Monastery mine," on the border of the districts of Winburg and Ladybrand, which is interesting as bearing indica-

tions of having been worked for minerals in bygone days ; and the other the "Driekopjes mine," about eight miles north of Kronstad.

Bloemfontein, the seat of government, is an agreeable inland town occupying a central position, with roads converging to it from all parts of the State. The total population, in 1892, numbered 5,817 persons, of whom 3,115 were Europeans or whites. From the railway station at the eastern end of the town, one of the main thoroughfares, Maitland Street, has a very attractive appearance. It possesses several fine substantial buildings and places of business. Among these are the Town Hall, the Bloemfontein Club, and the New Post and Telegraph Offices. In front of the latter is the spacious Market Square,

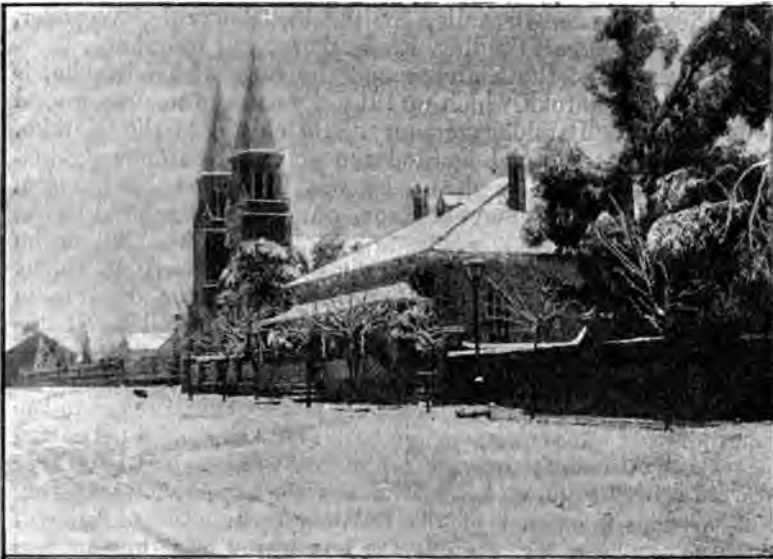


POST AND TELEGRAPH OFFICES.

and to its left the comfortable hostelry known as the Free State Hotel. On the southern side of the town is the cathedral of SS. Andrew and Michael, with the episcopal residence, Bishop's Lodge, adjoining. The Roman Catholic Church and Convent, the Wesleyan Church, and the Dutch Reformed Church, with its twin spires, are also conspicuous objects. The nucleus of a National Museum is provided for in a small building of historic interest, it being the place where the Bloemfontein Convention was signed by Sir G. Clerk in 1853. There is a public library, and daily, bi-weekly, and weekly publications of the local press. There are two banks, one the National Bank, and the other the Bank of Africa, both of which have branches in the district towns. There is also the Grey College, a lunatic

asylum, and hospital, the Presidency—a handsome residence occupied by President Reitz—and the Raadzaal, or Council Chamber of the Legislature. The latter edifice, costing £40,000, is designed in the Grecian style, and will be completed for the accommodation of the Volksraad this year. The dimensions of the debating chamber are 100 feet by 50 feet. This handsome structure is built of a beautiful freestone, occurring in beds in the neighbourhood.

A monument to the memory of the brave Commandant Wepener and other burghers who fell in the Basuto war, from 1865 to 1868, is erected on the road leading up to the fort, overlooking the town;



DUTCH REFORMED CHURCH, BLOEMFONTEIN.

and this year a bronze statue of Sir John Brand, G.C.M.G., who was President of the State for a quarter of a century, will be placed in front of the Government offices at the head of Maitland Street. This will worthily perpetuate the memory of him who, through all its troublous times, was truly the Father of the State, and whose household motto, *Alles zal recht kom*, has been amply justified by the advancement and prosperity of the country, and its friendly relations with all South Africa.

Bloemfontein is a healthy town, and has long been famous as a resort for invalids. Here, as elsewhere in the inland districts the summer is the wet and the winter the dry season of the

year, but owing to its geographical conditions the rainfall is variable, and droughts are apt to occur at uncertain intervals. The average rainfall for the last ten years was 23 inches, the highest in 1891 being 33 inches, and the lowest in 1883 being 16 inches. Thunder and hail storms come in summer, and snow sometimes falls during winter. In July, 1891, Bloemfontein presented a picturesque wintry appearance; the roofs of the houses and the trees were white with snow, which also lay fully a couple of inches deep in the streets.

The other towns and villages in the State are Fauresmith, Edenburg, Philipolis, Hoopstad, Jacobsdal, Boshoff, Winburg, Kronstad, Heilbron, Harrismith, Frankfort, Ladybrand, Ficksburg, Bethlehem, Vrede, Bethulie, Smithfield, Rouxville, Wepener, Thabanchu, Senekal, Lindley, Riddersburg, and Reitzburg.

In the centre of the State, around the town of Thabanchu, is the district of Maroka, which up till ten years ago was recognised as independent Baralong territory. Its chief was the Moroko, who with his tribe had assisted the emigrant farmers against Moselekatse. After his death, he was succeeded by his son, Sepinare; but in 1874 another son, Samuel, who aspired to the chieftainship, with some of his followers, made an attack on the town of Thabanchu, and tragically murdered Sepinare. President Brand, in order to suppress the outbreak and prevent any trouble with the Basutos on the adjacent border, incorporated the Baralong territory in the Free State; making provision that all natives and whites who had acquired property in farms from the late chief Sepinare and his Council, should retain them, subject to the condition that natives resident on such farms should be permitted to remain thereon during their lifetime. Large locations were also set apart for those of the Baralongs who had no such squatting rights. The remainder of the territory became the property of the State, and the farms on it are now leased by public auction for periods of from three to five years. Some of the Baralong landholders, with the sanction of the Government, who have to ratify such sales, have disposed of their farms to whites at fair prices, and joined their fellow-tribesmen at Mafeking in British Bechuanaland.



[To face page 461.]

A FARM NEAR MAUALIMBERUS HARBOR, SOUTH AFRICAN REPUBLIC.

CHAPTER XXVI.

SOUTH AFRICAN REPUBLIC.

THIS territory, formerly known as the Transvaal, but now recognised by the Convention of London as the South African Republic, was first permanently occupied by Europeans in 1838. In that year, a party of the Dutch emigrant farmers, under the leadership of Mr. Hendrik Potgieter, leaving their compatriots in Natal, recrossed the Drakensberg and proceeding over the Vaal River, established themselves where the town of Potchefstrom is situated. They found no difficulty in possessing themselves of the country, as the greater part of it had been depopulated during its occupation by the Zulus, under the chief Moselekatse, who, after their encounters with the emigrants had fled north into the region which afterwards received the name of Matabeleland. The new settlers thought that in the then remote wilds beyond the Vaal River, they would be exempt from all interference or control from without; but a proclamation, issued by Sir George Napier, Governor of the Cape Colony, reached them, stating that they were not released from their allegiance to the Crown, and that all offences committed by British subjects up to the 25° of south latitude, were punishable in the courts of the Colony. Thereupon, they resolved to move further northwards, forming new settlements at Ohrigstad, Zoutpansberg, and finally at Leydenberg. They thus became scattered in small communities without any cohesion, except that dictated by unity of interests in protecting themselves against their native neighbours. In course of time, however, they found their strength increased by accessions from the Cape Colony and Natal, and in 1844, a Volksraad, or People's Council, assembled at Potchefstrom, and adopted a simple form of government, according to a code of regulations which were agreed to, termed the "Thirty-three Articles." Afterwards, in 1849, Mr. Andries Pretorius, the leader of the emigrants in Natal, joined them and was at once appointed Commandant-General. He was instrumental in bringing about a reconciliation between the emigrants and the British Government, which resulted in the Sand River Convention of 1852. By this Convention their independent national status was recognised. They were allowed the right to manage their own affairs, and govern themselves

according to their own laws without any interference or encroachment of the British Government, north of the Vaal River.

In 1853, these leaders, Hendrik Potgieter and Andries Pretorius, died; and for some time afterwards discord and dissension prevailed among the different communities both in regard to political and ecclesiastical matters. At length a movement was made to unite the country under a central government; and representatives from the central districts met at Potchefstroom at the close of 1856, and adopted a constitution termed the Grond Wet, which vested the legislative authority in a Volksraad, composed of members representing the several districts, and the executive authority in a President, to be chosen by the people. The Constitution further declared that they would admit of no equality of persons of colour with white inhabitants, neither in Church nor State.

Mr. M. W. Pretorius, son of Mr. Andries Pretorius, was chosen and installed as first President; but the communities of Zoutpansberg and Leydenberg repudiated the doings of the Assembly at Potchefstroom, and formed themselves into an independent state. Eventually a reconciliation and union was effected; but from time to time partisan spirit repeatedly displayed itself, frequently occasioning civil disturbances.

In addition to these internal strifes, the community were engaged at intervals in petty wars with the surrounding native tribes. In 1853, an expedition was sent against the Bakwena chief Secheli, when the residence of the Rev. Dr. Livingstone (then absent) was plundered, which circumstance led to the missionary turning explorer, and opening up Central Africa to the geographical and colonising enterprises, which had signalised the latter part of this century.

In 1854 the tribe of a chief named Makapan were attacked and almost annihilated. They had put to death a party of Europeans with great barbarity, one of them, Hermanus Potgieter, being pinned to the ground and flayed alive, whilst others were subjected to shocking mutilations. The farmers assembled in strong force against the murderers of their countrymen, but found that Makapan and his tribe—men, women, and children—had fled to one of the vast caverns common in that part of the country. There they were besieged, and all the entrances to the caves blocked up, so that the entire multitude perished of thirst and famine.

In 1866 there was a general revolt of the natives of Zoutpansberg, and commandoes were repeatedly called out; but the summons to arms was only tardily and partially responded to, and the Commandant, Mr. Paul Kruger, failing to enforce

authority, had to abandon the village of Schoemansdal and a large part of the district. A formal peace was subsequently agreed to, but the supremacy of the Government was not established for some time afterwards.

These troubles exhausted the meagre exchequer of the Government, and to provide for its exigencies and meet the liabilities incurred for the purchase of ammunition a paper currency was created and declared a legal tender. By the end of 1870 the amount issued was over £70,000, and the notes were depreciated to a fourth of their nominal value. At this time boundary disputes arose respecting the south-western portion of the Republic in connection with the assumption of British authority over the Diamond Fields. Arbitration was proposed, and President Pretorius acquiesced in it. But when the award of the umpire, Governor Keate, of Natal, was declared, and found to be against the Republic, the Volksraad, which assembled at the close of 1871, disapproved of the President's action, and repudiated all the proceedings connected with the arbitration and award on the ground, amongst others, that he had no authority to sign alone the act of submission, and that the signature of the State Secretary was required to make it valid. Mr. Pretorius, being virtually dethroned, at once resigned.

In the meantime, there were rumours of the discovery of gold in the country, and this, together with other developments which were occurring in South Africa, led many of the inhabitants to look for a new leader outside of their own community. The constitution was amended to allow of persons, other than burghers of the Republic, being chosen for the office of President; and at the election in 1872 the choice of the people fell upon the Rev. T. F. Burgers, a clergyman of the Dutch Reformed Church in the Cape Colony. He initiated a progressive policy which temporarily infused new life and spirit into the country; and the discovery of gold in the valleys of the Drakensberg, east of Leydenberg, stimulated the brightened prospect. With the approval of the Volksraad he succeeded in negotiating a loan with a Cape bank for the redemption of the Government paper currency at par. He submitted measures for the survey of all public waste lands, for the appointment of a judge, and for the promotion of education. He also obtained authority to raise



PRESIDENT BURGERS.

a loan of half a million sterling to construct a railway from Delagoa Bay to the Drakensberg, and thus obtain access to a port free from what he termed "the trammels of British influence." He then visited Europe, where he was only partially successful in negotiating his railway loan, and failed altogether in his anticipations that the gold discoveries in the Republic would attract to it a European population. On his return he found the country drifting into war and insolvency. A chief named Secocoeni refused to pay taxes and molested the farmers in his neighbourhood. The Volksraad resolved to declare war against him, and the President entered upon hostilities, which soon passed beyond his strength. An attempt to storm Secocoeni's stronghold was repulsed, and the failure resulted in the disorganization and dispersion of the combined burgher forces. Mr. Burgers found that in his absence from the State the spirit of discord and faction had again spread amongst the people. His railway scheme was disliked by the Conservative Boers, and to a large party of them, who had fervent and deep-rooted religious convictions, he became obnoxious on account of what were supposed to be his heterodox views. The majority of the burghers refused to pay their land and other taxes. The President and Executive, in order to carry on the Government, borrowed money on their own personal security to the amount of £20,000; but this was soon spent. The State exchequer was empty, the Government was powerless to enforce its authority, and the British Commissioner, Sir T. Shepstone, who was then at Pretoria, thought that circumstances had arisen to justify the annexation of the Republic, which he, in April, 1877, proclaimed as British territory.

The events which followed—the ineffectual appeals to England to rescind the annexation, the non-fulfilment of the promises with regard to the assembling of the Volksraad, the war of independence and the retrocession of the State—have already been elsewhere told.

For three or four years following the restoration of the Republic, its prospects were by no means bright. The public revenue and the credit of the State were declining, and the Government was apprehensive of having to face difficulties similar to those which occurred during the Burgers' *régime*. The discovery of the De Kaap goldfields, followed by the opening of the mines at Witwatersrand, quickly changed this condition of affairs. A stream of population set in from all parts of South Africa, as well as from abroad. Money poured into the exchequer; and the country was quickened into a new life and prosperity, which it has since enjoyed in a continuously-increasing degree.

The South African Republic, like the Orange Free State, lies entirely inland, and nowhere touches the sea; but in other respects it has natural advantages superior to any portion of colonized South Africa. Throughout its wide area, estimated at 113,642 square miles, the greater part of its surface consists of rich, grassy pasturage, and well-watered and fertile soils; while embedded in its rock formations is an almost illimitable supply of mineral wealth.

The southern and eastern parts of the Republic are at an elevation of 4000 to 7000 feet above sea-level; and known by the name of the Hoogveld or high country. On the edges of this plateau, the land breaks off into lower hills and valleys, which is termed the Bankenveld or terrace country. North and north-east of this, at a lower level, and enjoying a warmer temperature, is the Bushveld or bush country, in some spots broken by a series of hills and covered with high grass, bushes and trees. Under these varying physical conditions, one part is found to specially favour the breeding of cattle and sheep, another the cultivation of cereals, while a third admits of the growth of tropical and sub-tropical productions. The southern and south-eastern parts, such as Lichtenberg and Potchefstroom, Heidelberg, Wakkerstroom, Utrecht, Ermelo, and New Scotland are particularly suited to sheep-breeding as well as to agriculture; the central part, as Marico, Zwart Ruggens, Rustenberg, Pretoria, and Leydenberg, are the best for cattle and corn; whilst the most northern portion, including Waterberg, Zoutpansberg, and a part of Rustenberg, are especially fitted for coffee and sugar plantations and tropical fruit culture. Tobacco of good quality is largely produced, and exported to the Free State, Natal, and the Cape Colony. Maize is generally sown in summer, when the abundant rains render artificial irrigation unnecessary.

The plateau of the Highveld is healthy for cattle and sheep, but during the inclemency of the winter season, when the grass is dry and hard, it is necessary to move stock to the lower country, either on the eastern side of the Drakensberg in Natal and along the borders of Swaziland, or to the warm shelter and sweet grasses of the Bushveld, north of the Magaliesberg Mountains. The whole country is well supplied with water and rich in springs, and in the district of New Scotland there is a large sheet of water, named Lake Chrissie, about five miles long by one broad, with lesser ones in the neighbourhood, abounding with wild-fowl and duck.

A census of the population of the Republic was taken in 1890, but it is generally considered to have been very imperfect and incomplete. It gave the total white population as 119,128; and

of these the Transvaal-born numbered 59,394, or 49·85 per cent. of the whole; the Cape-born 29,285, or 24·58 per cent.; the Free State-born 11,527, or 9·68 per cent.; and aliens of all nations 14,334, or 12·03 per cent.: of the latter, 8,980 were British, 1,943 Germans, and 1,420 Hollanders. The officials in the Civil Service numbered 705 Afrikanders, 225 Hollanders, 28 Englishmen, and 15 Germans. The number of persons entitled to vote was given as 12,439 or 10·44 per cent. only, and the number of men from sixteen to sixty years of age liable to be called out for military or commando service was given as 37,378.

At the present time the white population is about 160,000 persons, and the coloured native population, according to the census of the native department, numbers 649,560, of whom over 271,000 are returned as in the district of Zoutpansberg. The total white and coloured population of the Republic may, therefore, be stated at 809,560 souls.

In former years every burgher born in the Republic, on attaining his majority, had a right to a freehold farm out of the lands of the State; but the law conferring this privilege has been repealed, and the State is itself now possessed of all the waste lands of the country. These are estimated to amount to over 9,000,000 acres, and portions of them lie in good districts. Public companies and syndicates have during the last three or four years acquired extensive tracts of land by purchase. The total area held by one of these, the Consolidated Land Company, is about 2,341,560 acres, and the extent held by other companies and individual capitalists may be stated at another two and a quarter million acres. Most of them have in contemplation the division and sale of these properties as farms, with a view to their occupation and settlement.

The value of agricultural and pastoral land in the Republic varies according to its known capabilities, and its neighbourhood to the railway or to payable markets. In Pretoria, the central district, containing the seat of Government and with Johannesburg on its southern border, the average price of farming lands is £1 per morgen. The same price maintains in the Heidelberg district. At Potchefstroom (agricultural, but distant from a market), and at Lichtenburg (sheep and goat country), the average value is 10s. per morgen. At Rustenberg the great fruit-growing division of the Republic, the cultivated parts towards the south-east are of the same value as Pretoria land; but the Bushveld part averages only 15s. per morgen. In the northern districts of Waterberg and Zoutpansberg, which are in a great measure waterless, and at present worthless for agriculture,

especially towards the Limpopo, the average value is about 2s. per morgen, but on their southern limits it is considerably more. Farms here, other than those on which minerals have been found, are principally of value as adjuncts to those in the Highveld.

The district of Wakkerstrom, on the south-eastern side, contains the most valuable lands in the Republic, as they are as suitable for cattle-grazing as for agriculture, and their average value is £2 per morgen. Standerton, on the Highveld, is a cattle district, averaging from £1 to £1 10s. per morgen. In Ermelo, suited for agricultural and pastoral purposes, and where sheep-farming is greatly on the increase, the value is £1 per morgen. At Leydenberg, the chief grain district, possessing a fertile soil and abundance of water easily utilised, it is also £1 per morgen. In Utrecht and Vryheid, agricultural and cattle districts on the extreme south-east, the average price is 10s. per morgen. There are numerous instances, however, throughout all these districts where much higher prices are paid for farms favourably situated and exceptionally good.

The actual occupation of the lands of the Republic is chiefly in the hands of the Transvaal-born or Boer population, and a sprinkling of Afrikaners and others. Most of these farmers lead a quiet pastoral life, devoted to the breeding and rearing of cattle and sheep, and to a very small extent to the cultivation of European crops. What may be accomplished, however, in the way of development of agriculture has been forcibly shown by the *Times* correspondent, in "Letters from South Africa," describing the estate Irene, on the railway line within a few miles of Pretoria. At this place scientific modern farming has been adopted for two years, with a result demonstrating that the capabilities of the soil are no less amazing than the mineral resources of the country. "Sowing and reaping," says the writer, "go on all the year side by side, and there is no fallow time for the ground. There were pea-nuts ready for reaping, and green oats, barley in the ear and barley in the shoot, Swedish turnips fit for storing and Swedish turnips just shooting, mangold-wurzel also in both stages, rye in the ear, carrots quite young and carrots ready for storing, potatoes in both stages; and in one immense field the sowers and the reapers had literally met. At the far end maize was standing, reapers were busy cutting and carrying the sheaves of corn; upon their heels sowers followed, putting wheat into the ground; and at the near end, where, my host told me, maize had been standing ten days before, thin green blades of wheat were already shooting. So vigorous is the growth of everything that forest trees planted only two years ago were

already high enough to give shade; apples grown from seed of March and grafted in October will bear fruit this year. With the exception of cherries, gooseberries, and currants, all European fruits flourish well. Throughout the estate the water-courses, which divided the field, were bordered by hedges of quince, pear, apple, plum, and peach. The gardens contained a profusion of European vegetables and fruit trees. Acres of roses, violets, and ornamental plants surrounded the house, but nothing seemed to impress upon me more vividly the rapidity with which the place had sprung into being than the simple fact that, after hours of driving through vineyards, woods, and cornfields, we were met at the door of the house by a baby child of two and a half, who was older than everything that we had seen. The estate had been named after her. When she was born the spot on which it stands was nothing but bare veldt."

The great and prominent industry of the Republic, however, is gold-mining. The total output of gold from all parts of the country, in 1892, was 1,325,394 ozs. 5 dwts., which fact places this portion of South Africa third on the list of the gold-producing countries of the world; and as the industry is still in course of steady progressive development the State promises within a year or two to surpass the yield of Australasia, and even to take the premier position, as a gold-producer, now held by the United States.*

The history and progress of the gold discovery may be briefly told. In the early days, when the emigrant farmers trekked across the Vaal River, their sole idea was the acquisition of land and the stocking of it, and no thought was given to the exploitation of minerals. When in later years, about 1854, a discovery of gold was reported, the Government, apprehensive of an influx of foreigners, and of the newly acquired independence of their country being endangered, prohibited prospecting under a heavy penalty. In 1867, however, the existence of auriferous formations in the northern parts of the country was made known by the German explorer, Mauch, and soon afterwards all restrictions on prospectors were withdrawn and every encouragement given by the Volksraad to those engaged in advancing the discovery of this noble metal. In 1869, Mr. E. Button explored the country from Leydenberg north to Lataba, finding indications of gold in every direction, and what he regarded as permanent reefs at Eersteling and Marabastad. In 1872, the first gold laws were published, declaring mineral rights to belong to the State, and offering

* The gold production of the United States in 1891, was 1,604,840 ozs.; and that of Australasia, for 1890, was 1,591,894 ozs.

rewards for payable gold-fields. The discovery of the Leydenberg alluvial fields, was shortly afterwards claimed by Messrs. McLachlan, Sutherland, and Button, and digging operations were successfully carried on at Pilgrim's Rest, MacMac, and other camps in 1873 and succeeding years. At this period, there was little reef-mining attempted, the alluvial being mostly worked, and a considerable number of nuggets were found, including some weighing 119, 123, and 215 ounces. The ground, however, was considered "patchy," and although some of the diggers met with a fair measure of success, the population gradually dwindled down in 1877 to a very small community. During the period of the Annexation, little progress was made in gold mining. Sir T. Shepstone, the Administrator, engaged an Australian expert, named Armfield, to make an examination of the most likely places within the territory for the occurrence of gold, and he, for some time actually worked near the Witwatersrand, within sight of the "banket" conglomerate beds, but finding only comparatively barren quartz, abandoned the locality. On the retrocession of the country, the Republic, represented by the Triumvirate, inaugurated the "concession" policy; and under this system, in consideration of a payment made to the Government, concessions were granted to owners or lessees of lands, giving them free and undisturbed right to all minerals formerly claimed by the State.

In 1882, attention was directed to the neighbourhood of the Kaap Plateau and valley, where Mr. G. P. Moodie threw open to prospectors a large block of farms belonging to him. Gold-bearing reefs were then found on what is known as Pioneer's Hill, and subsequently on adjacent ground north and eastwards. This tract was proclaimed a gold-field in November, 1884, and its area was considerably extended in the following year. Reports of the auriferous nature of the country being now favourable, capital was forthcoming chiefly from Natal to work the reefs, and the gold very soon figured among the exports. The discovery, in 1886, of the Sheba mine and its phenomenal yield, created a fever of excitement. Its proprietors enjoyed extraordinary luck. They were a small body of storekeepers and prospectors, numbering fifteen men, viz.: Messrs. W. Hayes, F. C. Liddle, W. R. Brown, H. W. Taylor, George Tilney, D. B. Scott, jun., Clement Scott, J. Carlyle, E. Wilson, A. Gall, W. Wallace, E. A. Preston, E. Bray, C. Dacombe, W. Griffiths. Four of these were chosen to do the work of prospectors, and the remaining eleven undertook to support them. Six months passed without any success, and they were about at their wits' ends to find means to carry on further, when one of them knocked off a piece of surface rock at a spot a few yards off the footpath which had been trodden by them

for months before on their way to and fro from their prospecting area to their huts. A panning of this rock (a blue compact quartzite) gave a marvellous result; and further tests by a hand battery confirmed its richness. The ground was carefully pegged out and secured, in accordance with the conditions of the gold laws. A limited liability company, named the Sheba Reef Gold Mining Company, was formed by the fifteen members, with a capital of £15,000 in £1 shares, and a working capital was obtained by the crushing of 200 tons of the ore at the Central and Rimer's Mills. The result of the crushing of the ore gave about 8 ozs. to the ton, and further crushings of 1,225 tons in 1886, yielded 8,892 ozs. The original shares of the Company rose to £20, then to £30, on to £50, and finally actually reached £90 in some instances. After this a "gold-fever" extended all over South Africa. From Kimberley and the Cape, men found their way to De Kaap by post-cart, wagon, horseback or foot. By the beginning of 1887 it was estimated there were 10,000 persons in the district. Barberton became the centre of operations and suddenly expanded into a town of considerable size, with hotels, stores, residential houses, and public buildings. Innumerable companies were floated and wild speculation ensued; but a collapse soon followed from the discovery that some of the properties palmed off upon the public were little better than bogus concerns, and that in others the work of the development of the mines was crippled by too large an issue of vendors' shares and too small an amount of working capital. At the same time, the counter attractions of the Witwatersrand Fields, which were more accessible, and where the gold could be more easily and cheaply won, led to an exodus in that direction. Barberton and its mining neighbourhood, experiencing the chequered fortune incidental to gold-mining life, has now only a population of one to two thousand persons.

The present production of the De Kaap Fields is about 70,000 ounces per annum; and the total production for the six years from 1886 to the end of 1892 has been 287,792 ounces, of the value of nearly £1,100,000. Out of the ninety-six companies floated on the De Kaap claims, with a nominal capital of £6,459,500 and a working capital of less than one million sterling, there are not more than one-third the number now extant, and only about twenty-one of these show any signs of life and industry. Although as yet nothing of the nature of true fissure veins has been met with, auriferous deposits of considerable value undoubtedly exist throughout the rocks in the district. The mountainous character of the country in which they occur, involving expensive transport, and entailing difficulty

in handling the ore, has been the drawback to working. Now, however, with a branch railway from the Delagoa Bay line to Barberton, with the successful application of water for the transmission of electric power, with improved machinery, and appliances for the treatment of tailings, there is no reason why the De Kaap Fields should not largely increase its present output. The Sheba Mine still maintains the leading position. The vein of auriferous quartz running through the hill on which the property is situate is of exceptional width and richness. Operations for some time were carried on, in what was simply an open-faced quarry on the hill-side, and a chamber 50 to 60 feet wide, 210 feet long, and varying from 90 to 160 feet in height, was excavated, and the ore extracted without leaving a single pillar, or putting in any timber. The reef itself, in some places, has a width of 156 feet, and its peculiarity is the occurrence in the stratified quartzite of rich zones or ore shoots, carrying many ounces to the ton. The crushings now uniformly include rich and poor ore together. The supply is practically unlimited; and is only dependent upon the transport appliances from the mine to the mill, a distance of three miles. This is now accomplished by an Otto's aerial tramway; and lately, electrical hoisting gear—the first of its kind applied in South Africa—has been utilised for hauling and other purposes. In 1887, the property passed from the hands of the original claimholders into the possession of a new company, whose headquarters are in London. The capital of this company was increased to £650,000, and the original shareholders received in all for their interest 528,000 £1 shares, being on the basis value of £33 per share—the selling price at the time. Before then the claimholders had won 13,447 ounces of smelted gold, or an average of 5 ounces of gold to the ton of ore smelted. Since the present company assumed control, 110,000 ounces of smelted gold have been extracted from the mine, making the output, to the close of 1892, 123,447 ounces, or within a fraction of 1 oz. 14 dwts. of gold per ton of ore milled. In that division of the Kaap Fields known as Moodie's, where the mines lie mostly among the hills, some properties turn out two or three hundred ounces of gold regularly per month; and their prospects are likely to be greatly improved when the arrangements for an efficient system of electrical transmission of power are completed.

The discovery of the auriferous "banket" or conglomerate beds at Witwatersrand, which completely threw the Kaap Fields into the shade, occurred in 1885. For some time previously a search for gold had been made in the surrounding tract of country, and among the parties working there were Messrs. Green, Bantjes,

Sonnenberg, Hammerslag, and Martiensen, who found some traces in the quartz in reefs on the northern slope of the range and in the valley of the Crocodile, as well as in the alluvial at Blaauwbank Creek. In 1884 Mr. H. W. Struben purchased properties in the district and obtained a concession of the mineral rights on the farm, Wilge Spruit, where he erected a small battery and milled some rich ore from a reef which he named the "Confidence." At this time he was joined by his brother Mr. F. P. J. Struben, who, while prospecting the neighbourhood, made the acquaintance of the conglomerate beds at the



ON THE HIGHVELD BEFORE THE GOLD DISCOVERY.

western end of the Rand, and found some of them carrying gold. They were then pointed out to several individuals and parties, and amongst others to a well-known experienced mining authority, who, at a cursory glance at them, discouraged the idea of their ever being payable or worth while giving any attention to. Test crushings, however, were subsequently made at Mr. Struben's mill, the most important of which was of ore from the present Bantje's Reef Gold Mining Company's property, which yielded 1 oz. 8 dwts. Following upon this proof of the payable character of the banket formation, the Government was communicated with,

and on the 20th September, 1886, the Witwatersrand was declared a public goldfield. A mining camp, known as "Ferreira's," formed of waggons, tents, and huts, quickly sprang into existence on the southern slope of the Rand, practically on the upturned edges of the main reef series of "banket beds," the proved wealth of which has since transformed this district from a bleak pastoral region into the most brilliant El Dorado the world has yet seen.

Prior to this the properties on the Rand were of comparatively little value. The farms were bare pasture lands, ranging in price from £350 to £750, and a sum of £10,000 would have sufficed to purchase them all. Mining leases over portions of them were obtained on very favourable terms by the pioneer prospectors; but as capitalists and representatives of syndicates appeared upon the scene, the value of land traversed by the "banket beds" rapidly advanced in price, and many of the Boer owners disposed of them for sums varying from £7,000 to £70,000. One of the farms, being Government ground and having a central position, was selected as a site for a town—which was named Johannesburg—and laid out in streets, squares, and building lots. These building lots or stands were offered for sale, on ninety years' leases, by public auction, in 1886 and 1887; they numbered in all about 1,800, of the size of fifty feet square, and realised over £50,000. Prices at the outset ranged from a few shillings up to £200 per stand, and some of the latter, situate in the principal thoroughfares, have within the present year changed hands at the enormously increased values of from £4,000 to £7,000.

The first stimulus to the mining industry on the Rand came from Kimberley. Mr. J. B. Robinson purchased the estate of Langlaagte, and Mr. W. Knight that of Driefontein; Mr. Goch and others secured the Wemmer block of claims; and soon afterwards a London firm of capitalists, represented by the late Mr. Herman Eckstein and Mr. J. B. Taylor, acquired the valuable property now known as the Robinson Mine. Natal syndicates sent their representatives, and the Cape Colony followed in the wake; while local residents, such as the Messrs. Struben, Whitehead, Meyer, and others, began work at once on the properties they had secured. Many of the newcomers, especially those from Kimberley, brought, in addition to capital, a practical experience in mining business to bear upon the development of the ventures in which they were engaged; and their enterprise and energy did much towards establishing confidence in the extent and permanency of the "banket beds." In those pioneering days the formation was considered of so unique a kind that many had doubts as to its continuance at any great depth. Some held theories of its being

a mere superficial deposit which would soon give out; others feared that at a comparatively short distance from the surface it would be found to be so metamorphosed as to lose its auriferous character; and afterwards, when the hard blue pyritic rock was reached, there was the apprehension that the cost of the extraction of the gold would be an insuperable obstacle to profitable gold-mining. But, as development went on, shafts and bore-holes were carried down many hundred feet, the best of machinery was introduced, and mine management passed from the hands of the inexperienced to really competent men, applying improved and economic methods of mining, and the newest processes for the treatment of ores.

The payable character and continuity of the auriferous deposits were then demonstrated in the most practical manner. The production of gold, which began in a small way in the latter half of the year 1887, steadily progressed during 1888, from 7,000 to 26,000 ounces per month; during 1889, to 39,000 ounces; during 1890, to 50,000 ounces; and during 1891, to 80,312 ounces per month. At the end of June, 1892, the monthly output advanced to 103,000 ounces. Johannesburg was greatly excited when it became known that the "centenary" record was reached, and crowds assembled at the "Corner" (Eckstein's Buildings), where the President of the Chamber of Mines, Mr. Lionel Philips, made the announcement that the then completed five years of the industry showed a total output of 2,429,694 ounces of gold, worth, roughly speaking, eight and a half millions sterling. Pre-eminent amongst the undertakings which contributed to this output, and have given name and fame to the Rand, has been the Robinson Mine. The total working capital contributed by its shareholders was only £55,000. Since then upwards of a quarter of a million sterling has been earned and re-invested in permanent works, machinery, and development; whilst a total of £570,936 has been distributed in the form of dividends, besides leaving to credit of profit and loss account a sum of over £188,000. During the five years from 1888 to the end of December, 1892, a total of 240,551 tons of rock were manipulated, resulting in a yield of 411,502 ozs. 10 dwts. of gold, the average being at the rate of 1 oz. 14 dwts. 5 grs. per ton.

During these five years of mining development and progress the camp which formed the embryo township of Johannesburg emerged and expanded into a remarkably large, handsomely-built, and well-ordered city, its growth being as rapid and marvellous as any of those centres of population which have risen like a dream on the American continent. In its first stage the buildings were generally of a temporary character; but no



[To face page 474.

EUKSTEIN'S BUILDING, COMMISSIONER STREET, ON 14TH JULY, 1892

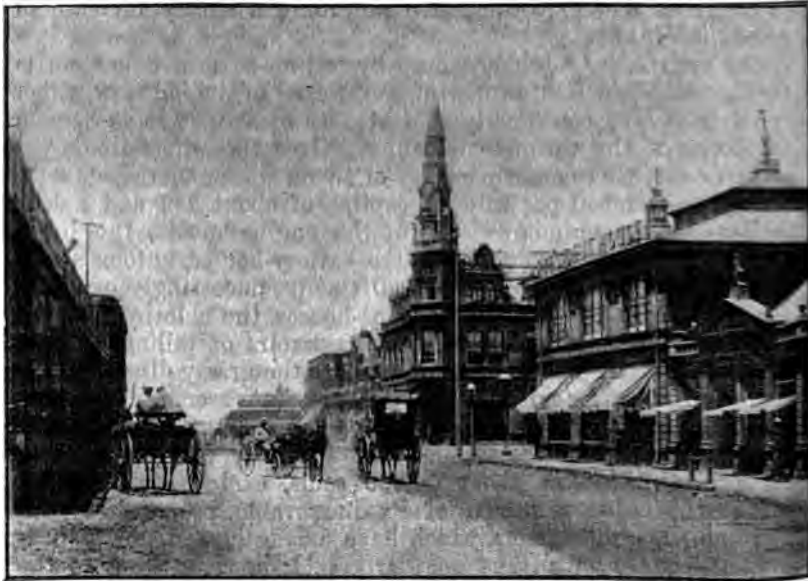


sooner was the permanency of the "banket beds" and the potentiality of their wealth established than the place was alive with brickmakers and builders, and comfortable dwellings, blocks of business offices, theatres, hotels, clubs, churches, and other public edifices were speedily erected. Nearly all the materials required for these structures, as well as the plant, machinery, and stores for the mines, had at this time to be brought from the seaboard, and for 300 miles of the distance were carried by the slow, cumbersome, and expensive agency of the ox-waggon. The railway only made its advent towards the close of 1892, and since then the city has continued making further strides in progress and expansion, still absorbing a steady increase of new inhabitants.

The approach to Johannesburg by rail for some distance skirts the line of Main Reef proper, and evidences of the industry which enriches it are continually exhibited as one passes in succession the works of the various companies. Over the whole line, from east to west, there are some sixty of them, whose shares actually issued represent at par value a capital of about ten and a half millions. The chimney-stacks of the engine-houses, the head-gear of the mining shafts, the huge battery-houses, automatically fed with their 20, 60, or even 160 stamps, unceasingly crushing day and night, the immense furnace-houses, the chlorination and cyanide works, with the adjacent reservoirs of tailings and of slimes following one after another over the grassy dips and rises of the country for miles upon miles, present a scene unparalleled in any part of the world.

Johannesburg of to-day, including the city and its suburbs, has a population of about 40,000 souls, exclusive of natives, and the taxable valuation of its immovable property is over £3,160,000. The streets, which have a length of about eighty-five miles, are broad and regularly laid out, stretching to the cardinal points of the compass, and intersecting each other at right angles. The city has been well designed, with open central squares, and ample reservation of spaces for public parks, while on every side it is surrounded by pleasant suburban localities, which are dotted over with villa residences and verandahed cottages, nestling among flower-gardens and shrubberies. Tree-planting has been wonderfully successful; stretches of bare ground, formerly destitute of any foliage or timber, are now covered with plantations, the growth of two or three years, flourishing in great luxuriance. In the principal thoroughfares there is a continuous throng of nervously-active, busy, pushing people, and in the neighbourhood of the "Chains," in Commissioner Street, crowded groups assemble morning and evening to

learn of the rumoured movements within the Stock Exchange, where speculative operations are carried on with all the roaring noises and frenzied excitement peculiar to a booming share market. A large portion of the central area is occupied by blocks of business offices, consisting of substantial two and three-storied buildings, such as Eckstein's Chambers, Bettelheim's Buildings, Braithwaites, Barnatos, the Standard, the Natal, Commercial, Union, Barberton, and Ginsburg Chambers. The Banking corporations are settled in handsome, commodious structures bespeaking wealth, and attached to them are assay



RISSIK STREET, JOHANNESBURG.

works, where the gold is smelted and converted into ingots for shipment to England, averaging a monthly amount of 110,000 ounces of the standard value of 77s. per ounce. The public buildings include the Government and Post and Telegraph offices, the new Law Courts, and the fine Hospital erected on the hill to the north of the city at a cost of £52,000. In the centre of the Market square are the Market buildings, which are admirably arranged for the purpose, and the most distinctive specimen of architecture in the city. In the main streets, such as Pritchard, Rissik, and President Streets, the array of shop-

fronts are as attractive as those of London or Brighton, and in one or two places Arcade buildings have been put up. The churches are numerous, belonging to various denominations, but architecturally none of them make any great show. The Jewish Synagogue with its dome is the most prominent in size. The Presbyterian, the Dutch Reformed, the Wesleyan, and the Roman Catholic Churches have suitable edifices, and the English Church is about to erect one of better ecclesiastical design than the present St. Mary's. There are three commodious theatres, a public athletic ground (the Wanderers'), with a pavilion to accommodate 1,500 persons, and two grand race-stands, which give evidence of the sporting proclivities of the inhabitants. The Rand Club, numbering some six or seven hundred members, one of the features of Commissioner Street, with its excellent cuisine and comfortable dining and lounging-rooms, is highly appreciated by visitors, to whom its advantages are hospitably extended. Hotels are numerous, including the extensive Grand Hotel, Heights, the Central, the North-Western, and the family quarters at Heath's in President Street. Almost everything necessary to the enjoyment of life can be procured if one is so well circumstanced as to be able to pay for it. Public traffic is carried on by means of carriages, carts, and lines of tramway, which latter extend to the suburbs of Jeppe's Town, Doornfontein, and Fordsburg; and most of the streets are now paved and macadamised, and lit at night by gas and electricity.

Such is this wonderful "Golden City," which has suddenly grown up, like a creation of Aladdin's lamp, on the Highveld of the Witwatersrand. The leading spirits of the community who have made it what it is—for, although under a Republican Government, free representative municipal institutions have been denied them—are ambitious of accomplishing other improvements which will make Johannesburg still more attractive and healthy. Foremost among these are the carrying-out of plans for a pure and abundant supply of water from the Klip or the Vaal River, and along with it a perfect system of drainage and sanitation, and some device for laying the demon of the "dust storm," which makes out-door life intolerable during many of the bleak winter days.

There is a general belief, which is shared by the best mining authorities, that the amazing accumulation of gold which is stored up in the underlying rocks of the Rand basin will last well into the next century. The life of the various outcrop properties, now being worked, is estimated at from fifteen to thirty years; and the reported new discoveries made from time to time of pre-

viciously unknown reefs or beds in the formation cut through, show that the mineral area is capable of expansion. But a new prospect has been opened up by the prospecting and development of what are termed "deep level" properties. The gold law of the Republic does not permit the owner of a claim to follow the reef in all its "dips, spurs, and angles"; it gives him the right to no more than his plumb within the four boundaries of his claim or claims. The general dip of the "banket"—which has a southerly inclination of about thirty-five degrees from the horizontal—led keen-minded men to see that outside of the outcropping claims of the Main Reef series, at a considerable depth from the surface, the formation would be equally continuous, and could be profitably worked even at two or three thousand feet; and within the last couple of years many hundreds of claims have been pegged out to a distance of upwards of a mile south of or below the present producing mines. The ground immediately south of the outcrop property is termed the "first dip," next to that is another parallel strip called the "second dip," and so on, the sequence being unbroken even to the twelfth dip.

On the best part of the Rand—that is to say the richest and least disturbed—thirty-six companies hold an average of three rows of claims, representing a strip along the Main Reef 1,200 feet wide, for a distance of about eleven miles. In this section there are, outside of the present working companies, about 3,000 claims pegged out as "deep level," on the greater proportion of which the "banket beds" are believed to lie at not unreasonable or unworkable depths. Bore-holes put down show as a mean result that the formation, at from 500 feet to 1,000 feet, has a dip of between 30 or 35 degrees, and does not deteriorate in size or value. The "Deep Levels" have so far passed their first stage that the work of shaft-sinking has commenced, and at the present time there are seven shafts in progress which are designed to be carried at once to depths ranging from 600 to 1,000 feet. The deepest of these is now down 300 feet; and as the rate of sinking has heretofore been not more than 60 feet per month at most, a considerable time must elapse before the mines enter on the productive stage. Combinations of capitalists, including some of the wealthiest firms in the mining world, have been formed to carry out these works; and it is said that in one venture funds running well into seven figures have been guaranteed for the subsidiary companies formed to acquire portions of the parent company's enormous claim-holdings.

Mr. Hamilton Smith, a well-known American mining engineer, recently made a very favourable report on the subject of these "deep levels" to the Messrs. Rothschild, the text of which

appeared in *The Times*. Mr. Smith visited the Rand in the latter half of 1892, and there studied the Main Reef series for a distance of about eleven miles along the outcrop, from which about two-thirds of the Rand's total output has come. He pronounced the opinion that for such a continuous length the record of production is unequalled in the history of gold-mining; observing that "there have often been mines of short length far richer than these of the Rand, but nothing approaching them has ever been, so far as regularity and extent are concerned." The conclusions, he arrived at, with respect to the future of the industry, are thus stated:—

"The question of profit is foreign to the purpose of this article; but as it is of importance to the question of product, it may be stated that twenty-one of the thirty-six surface mines especially examined by me are now being operated at a profit, and of the remaining fifteen several bid fair to soon become profitable. This ratio of paying mines is sufficient to insure the working of all, and they will all assuredly be followed down in depth until the working costs exceed the yield.

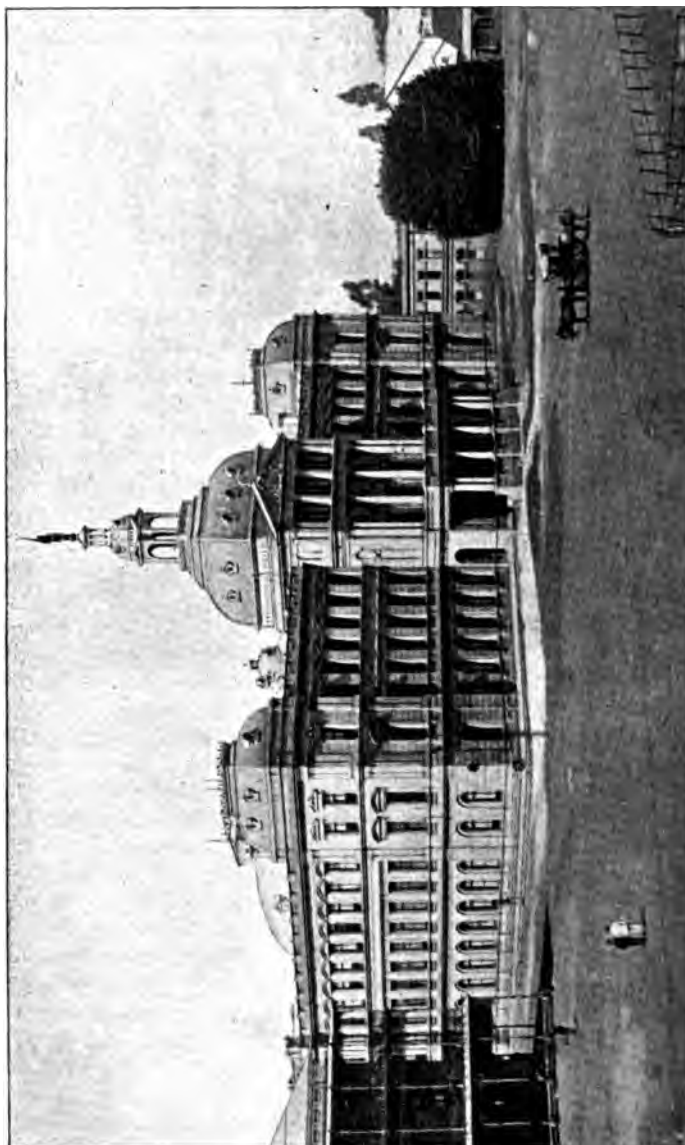
"Coming to the total quantity of gold which the Rand may be expected to yield, we have for the stretch of 11 miles particularly discussed a paying length of 50,000 feet, a probable thickness of fully 5 feet, and an inclined depth of 5,200 feet. This aggregates 100 million tons, of which 3 million tons have been mined; the remaining 97 million tons, at an average of 12½ dwts. per ton, would yield 60 million ounces, having a gold value of £215,000,000. I do not think it at all unreasonable to estimate that the many miles of 'banket' outside of this district of 11 linear miles will yield at least one-half of this amount, or, say, £325,000,000 in all. This seems a huge figure, but it is by no means a wild conjecture, and the final results will probably exceed even this sum. The large State of California, with gold almost from one end to the other, produced only £230,000,000 in gold from 1849 to 1892. This fact gives one an idea of the richness of these few square miles embraced in the Rand.

"With the active and energetic set of men who now have this industry in hand, and always supposing that the foregoing theories prove to be exact, in three or four years from now the producing power of the mines and their reduction works will, I think, be increased to an output of five or six million tons of ore per annum, with a gross yield of over £10,000,000. At this rate the available supply of ore, as conjectured above, will last for more than thirty years, and the world's yearly product will have increased from £19,000,000 in 1883, to perhaps £30,000,000 in 1897."

The mineral wealth of the country is not confined to the Witwatersrand basin. Along its northern edge, there is some extent of auriferous country, and eastward throughout the Highveld there are metalliferous belts, containing silver, copper, and lead, and an extensive area of coal-beds. In the Zoutpansberg district, along the Sutherland and Murchison ranges, there is a gold-bearing zone averaging 6 miles in width and 30 miles in length. In this district are the Klein Lataba, Marabastad, Woodbush and Silati Fields, which will soon be largely benefited by the Silati railway from Komati Poort to Leydsdorp, now in course of construction. The existence of valuable properties in that portion of the country has been established, although mining development and production have not yet attained to any great dimensions. In the district of Vryheid, on the border

of Zululand, "banket" deposits have been discovered, giving promise of good results upon development. The yield of gold from all the outlying fields of the Republic, including De Kaap, Leydenberg, Klerksdorp, Potchefstroom, Malmani, Marabastad, Woodbush, Klein Lataba, and Silati, amounted to 114,525 oza. 19 dwts. for the year 1892.

Although Johannesburg is now the active commercial centre of the Republic, the constitutional law of the country recognises Potchefstroom, situate on the Mooi River, as the capital, and Pretoria as the seat of Government. The latter is situated about 87 miles from Johannesburg, in an upland valley, surrounded by the Witwatersberg hills, about 4,500 feet above sea-level. It is a characteristic South African town, nestling among hedges of roses and lines of willow and blue-gum trees, with broad streets intersecting each other at right angles, and a stream of water coursing along their sides. But its picturesque features are rapidly being changed. Palatial buildings have been erected within the last few years; chief amongst them being the Government Buildings, or "Raadzaal," which are Pretoria's architectural glory. They have a frontage 175 feet wide, a depth of 220 feet, and a height of 125 feet from ground to the top of the figure of Liberty which surmounts the entrance. They contain in all 136 rooms, accommodating the President's office, the State Secretary's, the Executive Council, the Treasurer General's, the Auditor General, the Registrar of Deeds, the Orphan Chamber, the Surveyor General, the Education, Mining, and other departments of the Government, besides two chambers for the Volksraads. The first Volksraad, in which portraits of President Kruger, Commandant General Joubert, and General Smit are placed, is a spacious hall, 64 feet long by 44 feet wide and 42 feet high; and the second chamber is 44 by 44 feet. On the ground floors, there are fire-proof rooms, where the State archives and land registers are deposited. The building was erected from designs by Mr. Wierda, the Government architect, at a total cost of £138,000. It occupies one side of the Church Square, in the centre of which is the large Dutch Reformed Church. Other handsome structures have also been lately erected on the other sides of the square, including the Transvaal Loan and Mortgage Buildings, the Lewis and Mark's Buildings, the Lys Buildings and National Bank Buildings, to which is attached the State Mint, equipped with a complete plant and appliances for the coinage of gold, silver, and copper coins. All the banks have their establishments in this central part of the town; and new Supreme Court Buildings are intended to be built in the same vicinity. In the streets diverging from the square, and forming the principal business parts, several



THE GOVERNMENT BUILDINGS, PRETORIA.

[To face page 180.]



attractive shops and warehouses have taken the place of the primitive stores, which for years past served the purposes of the Boer trade. Many of the new inhabitants are showing a partiality for suburban residences, and in the neighbourhood of Heys Park, Arcadia, and Sunnyside, several handsome and finished private dwellings have been erected. The sanitary conditions of Pretoria have been greatly improved by an abundant and pure water supply; and in regard to its lighting, it is in advance of all the other towns of South Africa, upwards of one hundred arc-lamps illuminating its streets at night, and private houses being



BUILDINGS IN CHURCH SQUARE, PRETORIA.

furnished with installations of the incandescent lamp. The population is now estimated at about 11,000 persons, of whom about one-half are coloured; and the latter, comprising natives and coolies, have their allotted locations on the outskirts of the town. Being the place of residence of the President of the Republic, and the head-quarters of official life, as well as the locality where the Supreme Court holds its sittings, Pretoria will always be an important metropolitan centre; and there is the prospect, that when the Netherlands Railway works are completed, and the coal, iron, and other mineral resources in the surrounding neighbourhood are developed, important local industries

will be established. The principal one now in existence, is the Hatherley Distillery, within a short distance of the town, where the manufacture of spirituous liquors is successfully carried on upon an extensive scale, combined with all the most modern appliances. Cement works, and dynamite and powder factories, have also been started, but the latter is the only one doing active work.

At present Pretoria enjoys the benefit of direct railway communication with Cape Town, and in the course of next year the eastern line, covering a distance of 350 miles, to Delagoa Bay, will be opened for traffic. On its completion, it is promised that every encouragement will be given to the advent of the Natal line from Charlestown, for which surveys are in progress. The seat of Government will then be served from all the chief ports of South Africa—from the ocean on the east to the ocean on the south.

The exclusive right of railway construction and working within the Republic (except the Government itself undertakes construction and working) has been granted by a concession to the Netherlands South African Railway Company. The total amount estimated for the completion of the trunk line from Vaal River to Komati Poort, at the Portuguese boundary (a distance of 295 miles), was £4,314,817. For all the capital raised by the Company for the prosecution of the line, and the interest on and redemption of its debentures, the Government are guarantors. The eastern portion of the work was one of considerable magnitude, and its execution reflects much credit on Mr. Verwey, the engineer-in-chief. It had to be carried over a difficult country, and through the low valleys infested with malarial fever, horse-sickness, and the tsetse-fly. During the construction in the Komati and Crocodile Valleys the mortality among Europeans was twelve per cent., and great difficulty was experienced during the summer months in getting the farmers to ride material or supplies to parts where fever and the tsetse prevailed, while in winter there was a scarcity of grass for stock. The heaviest portion of the line (about ten miles) is stated to have cost £24,000 per mile, and the average of the whole will be about £11,600. The gauge is, as elsewhere in South Africa, 3 feet 6 inches. The ruling gradient is 1 in 50, but on a small section of three miles, near the station Bergendal, it is 1 in 20, where a locomotive with central cog-wheel will be used. Near this point, where the line ascends from the lower valleys to the plateau of the Highveld, a tunnel of 720 feet long is being made. There is some very grand scenery throughout the portion of the line approaching and passing the Eland Spruit Valley, and also bold

and picturesque views over the extensive Kaap Valley and the long-winding stretch of the Crocodile River.

Besides this main trunk line to Delagoa Bay—a distance of 350 miles from Pretoria—a branch line has been constructed along the Rand from Boksburg to Krugersdorp; one from Komati Poort, northwards, to Leydsdorp, in the Silati district (a distance of about 150 miles), is in progress, and a branch to Barberton is also being proceeded with. When these are completed, the extent of railways in the Republic will be about 550 miles. Under the provisions of the concession, the Netherlands Company's tariff may not exceed, unless with the consent of Government, the following rates:—For passengers, first class, 3*d.* per mile, and second class 2*d.* per mile. For usual freight



CROCODILE RIVER VALLEY, LOOKING EASTWARD.

goods 6*d.* per ton per mile, with a minimum of £1 per consignment. For rough goods, in quantities of at least five tons, 3*d.* per ton per mile, with a minimum of £1 per consignment. After a fixed term of years the railway may be transferred to the State, under conditions for the liquidation of the Company and payment of its shareholders.

The remarkable change in the country since the development of the mining industry is shown by the state of the public finances. Less than a quarter of a century ago—in 1870—the revenue of the State was only £30,000 per annum, while in the past year (1892) it was one million and a quarter sterling. The principal sources of revenue are customs, prospecting and diggers' licences, leases, stamp-tax, transfer-dues, recognition money, and

poll, road, and railway taxes. The following figures show the past and present condition of the Republic :—

—	Receipts.	Expenditure.	—	Receipts.	Expenditure.
	£	£		£	£
1871-2 .	40,988	35,714	1885-6 .	177,876	162,708
1876-7 .	62,762	64,504	1888 . .	834,440	770,492
1880 . .	174,068	144,942	1889 . .	1,577,445	1,226,155
1882 . .	177,406	114,476	1890 . .	1,229,060	1,531,461
1883 . .	143,323	184,343	1892 . .	1,225,829	1,188,765

The public debt, including the obligations of the Government as guarantors of the stock of the Netherlands Railway Company, is estimated at £7,000,000.

The commerce of the country, like the revenue receipts, has also advanced with leaps and bounds. In 1885-6 the total value of imports was estimated at £530,000, and the amount of customs duty paid £39,406. In 1891 the value of imports was £2,603,587, and the customs duties paid £316,660, while in 1892 the imports amounted to £3,498,801, and the dues paid were £441,436, of which the Witwatersrand alone contributed £247,670. The revenue of the Mining Commissioner's Department at Johannesburg for the same period (1892) amounted to £412,346, while the expenditure was only £29,521, showing a clear profit to the State of £382,824 from that mining area alone.

So large a proportion of the public revenue being contributed by the Europeans and Afrikanders who have lately entered the State, but who are unenfranchised, has led to a movement to secure to that class of the population some voice in the legislature of the country, and an association, known as the Transvaal National Union, has been established at Johannesburg with the object of obtaining, by constitutional agitation, more liberal recognition of their political rights than they now enjoy.

The Constitution, or "Grondwet" (fundamental law) of the Republic in its present form provides that the Government shall be Republican, that the Volksraad, consisting of representatives of the people chosen by the burghers qualified to vote, is the highest authority in the land, and, as such, entrusted with the legislative power; that the executive authority is vested in the President, and the judicial power in the High Court and Landdrosts Courts; and that the freedom of the Press is permitted. It also declares that the territory is free of access to all strangers who submit themselves to the laws and who have a claim to the protection of their persons and property. It does not, however,

admit of any equality between the coloured and white inhabitants, and no coloured person is admitted to the enjoyment of political privileges nor can hold land in his own name.

The President is the highest official in the State. He is elected by a majority of the votes of the burghers, and receives a salary of £8,000 a year, with house allowance of £300. He is entrusted with the Executive power, and is responsible to the Volksraad. He has also the duty of proposing laws which he may think necessary or may be suggested to him by the people. Once a year, he is required to visit all the towns of the Republic. During his term of office he may not undertake any other service nor engage in trade, and may not leave the country without consent of the Volksraad. Mr. S. J. P. Kruger has been President of the Republic since 1882, having been thrice elected to the office. He was born in the Cape Colony on the 10th October, 1825, and as a stripling of thirteen years of age accompanied his father, one of the emigrant farmers, who crossed the Vaal River, and settled in the Republic in 1839.



PRESIDENT KRUGER.

The President exercises his power in conjunction with the Executive Council, which consists of the Commandant-General Mr. P. J. Joubert (who is elected by the people for ten years), two non-official members, Messrs. Smit and Wolmarans, elected by the Volksraad for two years, and the State Secretary, Dr. Leyds, elected by the Volksraad for four years. The Superintendent of Native Affairs and the Keeper of the Minutes are *ex officio* members of the Council; and the President may invite any of the official heads of departments to be present and have a vote in the Executive on matters relating to their departments. The State President and members of the Executive Council have a seat in each Chamber of the Legislature, but have no vote.

Until the year 1890, the Legislature consisted of one Chamber, the Volksraad, but as a concession to the cry of the new mining population for political privileges of some sort, a second Raad or Chamber was then created, with powers to regulate, either by

way of law or by way of resolution, any matters relating to mining; the making of waggon and post roads; posts and telegraphs; the protection of inventions, patents, trade-marks, and copyrights; the conditions, rights, and duties of companies; insolvency; civil and criminal proceedings, and such other matters as the First Volksraad shall refer to it. All resolutions or enactments passed by the Raad must be notified to the President and the First Raad within forty-eight hours after passing the same; and the First Raad upon its own motion, or upon the advice of the President, may reconsider each resolution or enactment and confirm or disallow the same.

The First Volksraad, constituted of twenty-four members, born in the country, or who have been duly enfranchised burghers for fifteen years, is by law declared to be the highest power in the State. The qualifications required of members are that they belong to a Protestant Church, are thirty years of age, owners of landed property, and have acquired the burgher right before 1890 or after that by birth. These members are elected by burghers qualified to vote, who acquired burgher rights before 1890, or those born after that date, who attain the age of sixteen years. But the privilege of voting may be extended, by resolution of the First Volksraad, to those who for ten years have possessed the right of being elected to a seat in the Second Volksraad.

The qualifications of the twenty-four members who constitute the Second Volksraad are that they shall be of the Protestant faith, residents in the Republic, possessed of landed property, and duly enfranchised burghers for a period of two years. They are chosen by the same constituency that elects the First Volksraad.

Members of both Chambers have an allowance of £3 per day during their attendance on legislative duties, and the Chairmen of both Houses, who are chosen among the members, receive £3 10s. per diem. The debates and all the proceedings are in the Dutch language—which is the official language prescribed to be used in all the Courts and public offices throughout the State.

Under the Naturalisation Law, a two years' residence, together with a payment of a sum of £5, is required of aliens before letters of naturalisation can be obtained, and in ordinary course they can only become full-fledged burghers, qualified to sit in the First Volksraad, after the lapse of twelve years. The process is as follows:—

An alien wishing to naturalise must register his name in the book of the Field Cornet in whose ward he fixes his residence. After residing in that ward for two years, and being on the book of the Field Cornet, he may apply to the latter, or to the Landdrost of the district, for a certificate that he has complied with the requirements of the laws, and bears a good character. On obtaining such a certificate, he may apply to the Landdrost to be naturalised, who, after examining the papers and

finding them in order, refers the application to the Executive Council, which approves or disapproves: if admitted, the applicant pays £5, and upon his taking the oath of allegiance to the Republic, letters of naturalisation (deed of burghership) are granted to him. His name may then be placed on the list of voters for the district where he resides, by the Field Cornet in whose ward he lives. After being registered, he may vote for a Field Cornet of his ward, for a member of the Second Volksraad of his district, and for every other election confined to that district, but not for members of the First Volksraad. After registration as a voter the naturalised alien may be appointed to any Government office, except to those to which the occupant is elected by the whole country. After having been on the voters' list for two years, he may be elected as a member of the Second Volksraad. After being a member of the Second Raad for ten years, or on the list of registered voters for twelve years (that is, ten years after the naturalised alien has become qualified to be elected a member of the Second Raad, whether elected as such or not), he is qualified to vote for a member of the First Raad, and to be elected as such, and to enjoy all the privileges of a burgher; but it is in the power of the First Raad, by resolution, to shorten the period qualifying the alien for the First Raad.

The judicial system of the Republic is to a great extent similar to that of the Cape Colony, and is almost identical with that of the Orange Free State. The ordinary judicial tribunals are—(a) the Court of Landdrost, analogous to that of Resident Magistrate in the Cape Colony and Natal; (b) the Circuit Court, presided over by one of the Judges of the Supreme Court; and (c) the Supreme Court, under the presidency of Chief Justice Kotze. Each district has a Court of Landdrost, with both civil and criminal jurisdiction. In civil matters the Landdrost has jurisdiction in liquid cases up to £500, and in illiquid cases to £100. In criminal matters, the Landdrost decides upon minor offences and can inflict the following punishments:—Six months' imprisonment, with or without hard labour; twenty-five lashes; fine, not exceeding £75. A circuit court is held, for one or more districts, twice in each year, except for the Witwatersrand Gold Fields, where the circuit court sits more often, as occasion may require. The circuit courts are held by a judge of the Supreme Court, who, in criminal matters, is assisted by a jury of nine citizens. The law requires a unanimous verdict of the jury in all instances. From the Court of Landdrost there is an appeal to the Circuit Court, or direct to the Supreme Court, at the option of the appellant. In like manner an appeal lies to the Supreme Court from every final decision of the Circuit Court.

The Supreme Court has an original as well as an appellate jurisdiction over the whole country. Its decisions are in all cases final; there is no appeal. The judges must by law be graduates of some recognised university, or otherwise properly qualified in law. The Chief Justice and the fourth puisne judge are both graduates of an English University and barristers-at-law; the first puisne judge is a barrister-at-law, while the second and third puisne judges are graduates of a Dutch University.

There are special tribunals called "Land Commissions" for each district, with jurisdiction to investigate all questions of disputed boundaries and beacons. These land commissions, composed of three prominent citizens of the district, are supposed to be useful and expedient, inasmuch as they hold a local inspection in each case. Written minutes are kept of their proceedings, and an appeal lies from the decision of a Court of Land Commission to the Circuit or Supreme Court.

The Field Cornets of each ward (a subordinate division of a district) have also jurisdiction in questions involving disputes between master and servant, and other petty matters. In every instance an appeal lies to the Circuit Court, or the Supreme Court, which is the highest court of review in the State. In districts in which the natives are numerous there are officials, known as Native Commissioners, with jurisdiction both civil and criminal in all matters between natives and natives. Serious criminal cases, however, are brought by the Attorney-General before the Circuit or Supreme Court.

The common law of the Transvaal, like that of the whole of civilised South Africa, is the Roman Dutch law, except where altered by local legislation or the custom of South Africa.

Public education is subsidised by the State, under certain conditions; the quarterly contribution by Government, not exceeding 25s. for each pupil in the lower, and 35s. in the higher education schools. There are 552 village and district schools, with 8,170 pupils. All instruction must be in the Dutch language in the subsidised schools; only in learning foreign languages is exception made. Although Dutch is the official language, English is the language chiefly spoken in the towns, and in all the business places, as well as in many families.

A Board of Examiners in literature and science is established by law, and consists of nine members, with the Chief Justice as President. It conducts examinations in survey, chemistry, law, literature and science, and also grants teachers' certificates after examination for the purpose. A similar board, consisting of three qualified practitioners, acts in conjunction with the Board of Examiners in so far as applications for admission by medical men, chemists and dentists are concerned. By a law of 1891, all holders of a Government appointment, whether professional or otherwise, must be naturalised or registered as burghers.

The Republic has no armed force, with the exception of a small corps of mounted artillery and police; but the President, with the concurrence of the Executive, can, in case of disturbance or war, call up a commando of the burghers of each district.

The landdrosts, field-cornets and commandants of burghers are

elected by the burghers of each district; but the nomination of the landdrost is made by the State.

There is an excellent postal and telegraph system throughout the country; and large sums are being spent in public works and improvements, creditable to the Government.

A number of concessions has been from time to time granted by the Government, with a view to encouraging the development of industries in the State. Some of these, such as the right of manufacturing spirituous liquors, conferred a monopoly upon the concessionaires, others were subject to certain conditions which the Government may impose or relax at its discretion, or cancel altogether, as it has recently done in regard to the concession for the manufacture of dynamite and other explosives. Many of those concessions have lapsed by reason of the failure of the concessionaires to make the payments to the public revenue which they contracted to do. The number still in existence is comparatively few. These include the concessions for the manufacture of spirituous liquors, of powder, of woollen factories, of sugar mills, of cement works, of a machine bakery, of oil factories, lucifer match, and porcelain, and tile-making, the manufacture of oils in Middelberg and Leydenberg districts, aerial tramways, the manufacture of gas at Johannesburg; the supplying of gas, electricity, and water to different places; and the establishment of the National Bank. Besides these, there are a number of concessions giving mineral rights on various private properties. Latterly, however, the policy of concession-granting has met with public disapproval, and the Government has to a great extent discontinued it.

Under the provisions of the concession granted in 1890, to a syndicate formed by Dutch, German, and English bankers for the formation of the National Bank of the Republic, arrangements were made for the establishment of a State mint at Pretoria; and in 1891 a mint law was passed, determining the coinage. The English monetary system was adopted, with the exception that the gold coins are a trifle finer, but not sufficiently so as to allow of their being exported to Europe for smelting, the standard weight of the one pound gold piece being fixed at 7·98805 grams, and the one shilling silver piece at 5·65518 grams, and other coins in proportion. The erection of the mint has been completed by the Bank, which has the use and working of it for twenty-five years, under the supervision and control of the Government. The coinage now being minted is legal tender within the Republic, and a movement has been made to secure its free circulation in the other Colonies, States, and Territories. At the invitation of the Government of the Republic, a conference of delegates

from the Cape, Natal, and the Orange Free State, assembled at Pretoria to discuss the question. All the delegates, with the exception of the representative of the Republic, agreed to a proposal submitted by Mr. L. L. Michel, the Cape representative, that the Pretoria Mint should be reconstructed as an Inter-State Mint, due regard being paid to the rights of the present concessionaires; that such mint should be carried on in the name of the four States, at their expense, and under their joint supervision and control; and that a representative South African coinage, having the arms of the several States quartered on it should be proclaimed legal tender, and have free circulation throughout the country. The matter is meanwhile referred for further consideration to the respective governments. If a scheme for the unification of the coinage in South Africa, as thus suggested, is carried out, it will, as Dr. Leyds, the chairman of the Conference remarked, form a new bond, binding and strengthening the friendly relations between all the States and Colonies of South Africa.

CHAPTER XXVII.

GOLD-MINING AT WITWATERSRAND.

BY FRANCIS SPENCER, M.F.I.M.E., A.I.M.E.

THE Witwatersrand Goldfield is situate thirty-five miles south of Pretoria, the capital of the South African Republic. It forms the watershed of the two great river systems, the Limpopo on the north, and the Vaal River on the south, and runs nearly due east and west. On its north, or Pretoria side, the country is broken, stretching away in alternations of plains, hills, and ranges of lesser mountains to the great Magaliesberg range—forty miles distant—under which a generous climate with the utmost luxuriance prevails. On the south the country is rolling grass land, dipping into the valley of the Klip River and the line of the “Black Reef,” 700 feet below the Rand, and extending into the further valley of the Vaal River, the common boundary of the South African Republic and of the Orange Free State.

The geological formation consists of sandstones, quartzites, shales, schists, and cherts, with beds of conglomerate interstratified in the sandstone and quartzite, and gold accompanying them. These have been tilted from the north, and dip south towards the centre of the basin. They appear to have been upheaved from their natural position by intrusive masses of diorite, dykes of which penetrate the country, causing faulting and disturbances; and to the solfataric action incidental to the eruption of the diorite is attributed the occurrence of the gold deposits. The conglomerates are well described by Mr. J. S. Curtis in the *Engineering and Mining Journal* of February 15th, 1890, as follows:—

“They consist of a mass of water-worn quartz pebbles cemented together by quartz sand, argillaceous matter, and hydrated oxide of iron. Magnetite is often present, and the matrix is frequently porous, sometimes containing breccia as well as pebbles, and is more or less friable. This is the general character of the deposits within the sphere of the oxidizing influences of the atmosphere. At the water-level, and sometimes above it, the nature of the banket changes, the colour becomes a bluish or a greenish grey, the limonite and the magnetite are replaced by pyrite, and the texture of the mass grows more compact and uniform, so that when broken the pebbles are fractured, and the faces presented to view are more even. The pebbles in the different series of reefs vary in size and composition, and the material

of the matrix is not always the same, so that it is often possible, by careful examination, to determine from which reef or series a particular hand-specimen was derived. For instance, the main reef series can be easily recognised from the nature of its pebbles and matrix. The pebbles of any of the bankets rarely exceed the size of a goose egg, and are usually much smaller. They are of various colours, white, grey, brown, and black being the most common. The same banket often contains as many as six different kinds. Sandstone pebbles are occasionally found, but the conglomerates containing them seem to be of later origin than those containing quartz pebbles alone.

"The gold is more or less crystallised and not water-worn, as can be seen when it is examined under the microscope. The presence of pyrite in the diorite and the banket indicates a strong solfataric action contemporaneous with or subsequent to the eruption of that rock. It is not likely that the pyrite in the diorite came from one source and that in the banket from another, or that this mineral was deposited at the same time as the pebbles. If it had been there would have been pebbles of pyrite. Crystallised quartz and other crystallised minerals are found in the conglomerate, and they are unquestionably of subsequent origin. All the banket reefs do not carry gold, but most of the ferruginous banket reefs do carry gold, and there is no banket reef bearing any gold which does not carry a considerable quantity of iron in one form or another. There is evidently even in these reefs a close connection between the iron and the gold. The occurrence of magnetite with the auriferous material is another characteristic which increases the resemblance of these deposits to the ordinary quartz veins. The fact that the gold is found in the banket and not in the sandstone can, I think, be accounted for in this manner: the conglomerate beds were naturally more porous and open than the sandstone, and after the upheaval gave easy access to the solution and vapours generated by the diorite eruption."

THE RAND BASIN

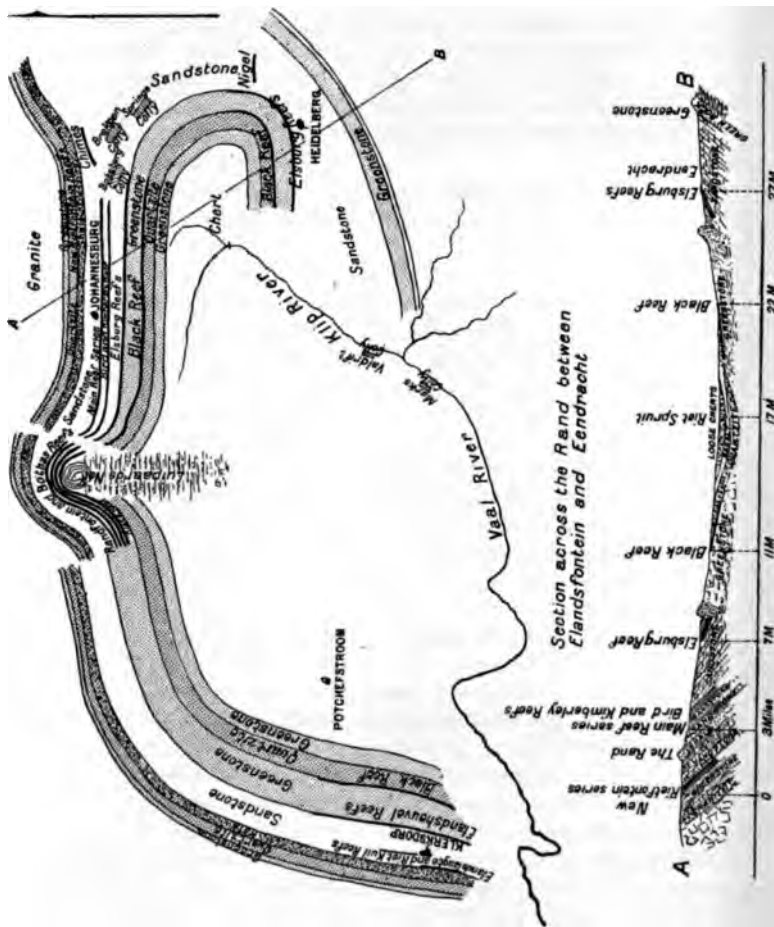
is about 130 miles long by 30 wide, and within it there is a series of these conglomerate beds, occurring opposite and near Johannesburg, in the following order:—On the north fringe, the Main Reef series and New Rietfontein Reefs; south, Bird Reefs, Kimberley Reefs and Elsburg Reefs; and extreme south, and nearest to the basin centre, the Black Reef. All course in parallelism, east and west, and dip south at angles flattening between the north fringe and the basin centre from 80 to 10 degrees.

Of these, the Elsburg and Black Reef series are found cropping out on the opposite shores of the basin, and dipping towards its centre. Whether they occupy the whole intervening basin area is an interesting point, but one which will hardly trouble the present race of miners.

The position on the south shore in which the Main Reef should be found is occupied by a belt of diorite, which has baffled prospectors, and retarded exploration in that direction. Attention is, therefore, at present more readily paid to the east and west extensions of the Main Reef, and its accompanying series on the north side of the basin.

Johannesburg, the chief town and mining centre, is healthily situated 5,600 feet above sea-level, half way along and on

Geological Chart of the Witwatersrand Basin





the southern slope of the Rand, surrounded by the suburban townships of Doornfontein, Fordsburg, Jeppe's Town, &c.

At the eastern extremity of the Rand, twelve miles distant, lies Boksburg, a coal and gold-mining town. The site of this town was originally a bare, uninviting slope, but through the efforts of its former magistrate, Mr. Montagu White, the place has been greatly beautified by liberal tree-planting, and the formation of a lake many acres in extent. Further east are the large collieries of Brakpan and Springs, whence the bulk of the Rand coal supplies are drawn.

Still further, at the eastern extremity of the Field, thirty miles from Johannesburg, is Heidelberg, the centre of the Nigel Reef district of the Rand Basin.

Westward, fifteen miles from Johannesburg, is Krugersdorp, the centre of the Botha's Reef, Luipaard's Vlei, and Randfontein mining areas.

A line of railway from the Springs Colliery to Krugersdorp skirts the Rand for fifty miles, and transports coal to the gold mines from the collieries of Boksburg, Brakpan, and Springs. This line is connected to the Main Trunk Cape Railway at the junction of Elandsfontein, six miles east of Johannesburg, whence the railway extends to Pretoria, the seat of government.

Under the provisions of the South African Republic's laws, all minerals belong to the State. Mining areas are granted under the title of "Claims" and "Mynpachts," or mining leases. Claims measure 150 feet on the strike of the reef, and 400 feet covering its dip, and are held under prospector's and digger's licences. Blocks of claims, in any number, are pegged off under power of attorney (a poll-tax of 18s. 6d. per annum being required for each signature) and are held under "prospector's licences" at 5s. per claim per month, until pay-reef is proved, when "digger's licences" at 15s. per month are compulsory. Blocks of ten to twenty feet long, by three or four deep, are usually held by mining companies. "Special registration" is effected, rendering title absolutely secure and unassailable. "Mynpachts," or mining leases, are granted to farm-owners, and comprise 10 per cent. of the farm area, measured twice as long on the reef strike as on its dip. These are hired or bought of farm-owners, the government dues thereon being 5s. per morgen (about two acres) per annum. A water right is granted on a digger's claim, held at 15s. per month.

MAIN REEF SERIES.

The Main Reef series proper is traced and worked for twenty-six miles between the extremities—Boksburg on the east, and

Roodepoort on the west. At each extremity, the country turns to the north, and on both extensions reefs are found and worked for many miles.

At the east, or Boksburg end, the main Rand formation strikes first in a north-easterly direction for about ten miles; then wheeling round in a half-circle, with a radius of about fifteen miles, forms the eastern end of the basin and part of its southern shore, which thereafter follows a south-westerly course to and across the Vaal River. In this sweep are included the Kleinfontein, the Modderfontein, and the Chimes series—the former found for about six miles, and both lost sight of in marshy ground about ten miles north-east of Boksburg. Both series contribute to the output at the rate of 8 and 12 dwts. per ton respectively, the richer being as usual the upper and southern beds.

Twenty miles south-east of this, and at the east end of the basin, is found the Nigel Reef. It is traced for about three miles and produces on the Nigel Company's property nearly 3, ozs. per ton, and is by far the richest occurrence in the Rand basin. Its extension has not yet been proved either along the south shore, or in the twenty miles of country between it and the "Chimes," nor has its identity with the latter been established. Its discovery and that of the Main Reef series through this country offers a fair field for moderate capital, and fortune to the successful man. That systematic search will probably be rewarded is indicated by the discovery at intervals of the various series known to lie south of the Main Reef. From these data, its line is approximately obvious, and the present obstruction to its discovery in the shape of deep over-lying loose soil will probably be overcome by the enterprising diamond driller. For the present it is satisfactory to note that all eastern developments demonstrate the continuity and wealth of the beds, and promise ample scope for labour and capital.

Beyond the western extreme of the Main Reef series, at Roodepoort, a deep bay, known as Luipaard's Vlei, intrudes from the valley of the Black Reef, directly obstructs the true strike of the Main Reef, and diverts the reef formations between two and three miles northwards. Coursing around its shores, the whole Rand series are found included between the Black and Botha's Reefs, and finally striking in a southerly direction through the extent of the Randfontein estates, are eventually lost sight of in a new break of the formation northward.

The working of the various series in this section was prosecuted with considerable vigour in the earlier history of the Rand, but proved generally unprofitable. Within the last year, however,

good results attained by the Champs d'Or on the Botha's Reef, and by the Randfontein estates, restored confidence in the region. Fresh capital is invested and general activity prevails. Results from this length of reef line now under development may be expected to figure appreciatively in the Rand output during the next twelve months.

West of Randfontein, and of the north break mentioned, the Black Reef is worked at intervals, and is traced with other "banket beds" corresponding with those found on Randfontein, for ninety miles past Potchefstroom and Klerksdorp to the Vaal River. But little work has been done in this section, which is still open for prospectors and capitalists' enterprise.

At Klerksdorp, the Black Reef series has been worked under the name of the Nooitgedacht series, and various other reefs have been opened up in the district, and are now being handled with vigour. Their identification with the Rand series, and their contribution to its output, are only questions of time and development.

THE INNER SERIES OF REEFS

are the Bird, the Kimberley, the Elsburg, and the Black. They lie respectively 1000, 2000, 5000, and 10,000 yards south of the Main Reef, and are traceable at intervals throughout the length of the north shore of the basin. The two latter are also found on the south shore.

The Bird, Kimberley, and Elsburg series—large bodies of low grade ore, amongst the first bankets discovered—were subsequently abandoned in favour of the Main Reef series, but are again attracting attention and are expected, under the cheaper working conditions prevailing, to yield profit on a value ranging between 3 and 10 dwts. per ton.

The Black Reef, so called from its characteristic foot-wall layer of black oxide of iron, is the innermost of the six series described, and is traceable for over 150 miles. It lies between quartzite and diorite, the latter forming its foot-wall, and is more highly mineralised than the northern beds not in contact with diorite. Its width ranges between one and six feet of banket, together with a foot-wall layer of one to three inches of oxide of iron. The banket is usually low grade, whilst the foot layer sometimes runs up to 20 ozs. per ton. Both are mined together, and produce a free milling result of 5 to 8 dwts. per ton.

In earlier times this reef was eagerly prospected, and found exceptionally rich in patches. When the patches were worked out, operations were in many cases suspended, and little has been done on the line for the past two years. Recently, profitable

returns have been forthcoming, and capitalists are taking up the line, and equipping properties for solid work.

It will be seen that (whilst the bulk of the Rand output is now from about 26 miles of the Main Reef series) a line of auriferous banket is traced for about 135 miles between Klerksdorp and Heidelberg, and that a series of six reefs or beds are more or less exploited. Further, the deep levels—already proved by numerous bore holes and now in course of comprehensive development—are untouched. It may therefore be gathered that the resources of this enormous field are but very partially developed, and that, in the expansion of the operations of the present producers, the prospective production of deep levels, and of new ventures on the



THE FERREIRA AND ROBINSON MINES.

extensions of the Main Reef and Inner series, the added results will, before the close of the century, attain a maximum which will probably amount to three times the present yearly rate of production.

THE EARLY WORKINGS,

dating from about the end of the year 1886, were characterised by considerable energy on the part of the pioneers. The "beds" were opened along the surface, inclined shafts sunk on their dips, and ore got out under the usual difficulties of pioneer-mining, viz., excessive water, want of material, and bad labour. Light five-stamp batteries were imported from Cape Town and Natal, and in work demonstrated the extraordinary richness of the "ore beds."

In May, 1887, the Wemmer Company produced 887 ozs. of gold, and stood alone as a producer until the following July. By the end of the year over twenty companies were milling, and had produced more than 23,000 ozs.

The year 1888 closed with forty-four companies on the producing list, and an output of nearly 208,000 ozs. It also saw the commencement of a "boom," which lasted into 1889. During 1889, the nominal capital of companies producing 370,000 ozs. of gold was £6,800,000, and was inflated to £13,255,000. The "fall" caused by this over-speculation ensued in 1889, and its disastrous effects on the credit of the fields were intensified by the difficulties which now beset the industry, and for a while financially crippled some of the producing companies.

As the mines grew deeper, excessive water and harder rock had to be contended with, and new and more powerful machinery became necessary. In the endeavour to supply themselves, and carry on the development of their mines in advance of their mills, many companies exhausted their working capital. Re-construction was resorted to, but during its incident delays, and those attendant on machinery equipment, some companies retired from the producing list. Despite these conditions, the year closed with an increase of 161,000 ozs. over the previous one, and a total of 369,557 ozs., but unaccompanied with any sign of recovery in the share market.

In 1890, strengthened by working capital, vigorous mine development—designed to put the mines on a sound working and dividend-paying basis—ensued, and was associated with a steady increase in the year's output, which closed at 494,817 ozs.

In 1891 entirely satisfactory progress was made. The number of contributors to the output increased, many dividends were paid, and the year closed with a total output of 729,238 ozs., and nearly 50 per cent. increase on the previous year.

At this time the market value of the companies producing 729,000 ozs. was £9,312,400, whilst in the boom in 1889, the value of the companies producing only 370,000 ozs. (or about half) was £13,255,000.

Deep-sinking, and extensive mine development, introduction of improved mining and milling machinery, and the expansion of metallurgical operations, have been amongst the efforts of the year 1892, and have been associated with an increased output of 481,530 ozs., an increase of 59½ per cent. over last year; the payment of £794,828 in dividends, and a general restoration of confidence amongst investors, accompanied by a steady rise in the market value of stocks.

The output of gold at Witwatersrand from 1887 to the close of 1892 was as follows:—

			ozs.	dwt.	
1887	...	...	23,125	8	
1888	...	...	208,121	14	
1889	...	...	369,557	5	
"	...	...	42,000	0	Estimated production
1890	...	...	494,817	0	of which no record kept.
1891	...	...	729,238	6	
1892	...	...	1,210,868	16	
Total			3,077,728	9	

ACTIVE WORKINGS.

Those portions of the Fields actively worked between Heidelberg East and Klerksdorp West are divided into several groups:—

East—At Heidelberg, the Nigel Reef; Intermediate, the Chimes Line; at Johannesburg (Central), the Main Reef Series and New Rietfontein Reefs; and South-central, the Black Reef.

West—At Krugersdorp, the Botha's Reef, and the Randfontein, and Luipaard's Vlei Series.

Extreme West—At Potchefstroom and Klerksdorp, the Bosch Rand and Elandsheuvel Series.

The country is much broken and faulted between the groups, throwing them out of continuous line, and rendering it very difficult to establish identity with one another, and with the principal Main Reef series. It is an accepted principle, however, that all the discoveries between the points indicated belong either to one or other of the parallel beds, which course along the north and east shores of the basin.

The Main Reef series is worked laterally for about thirteen miles on either side of Johannesburg, the ground being held by some sixty mining companies in various sized holdings of claims and "mynpachts."

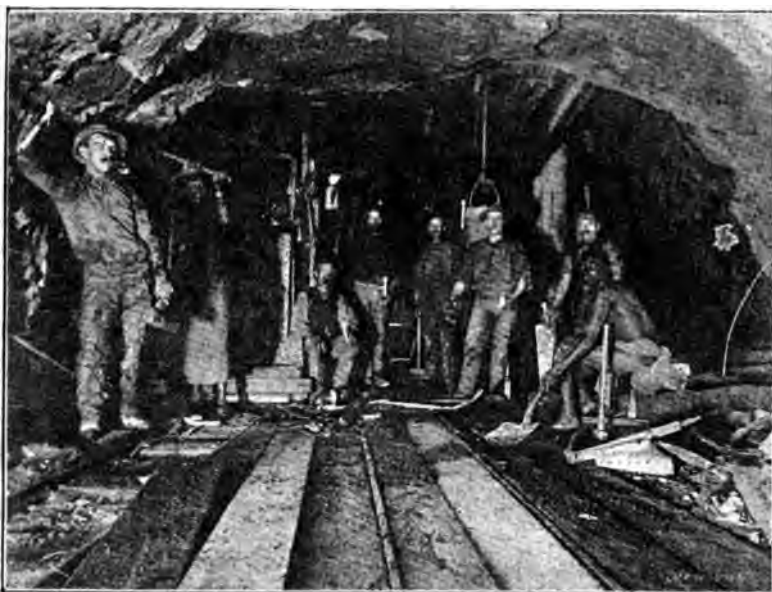
The depth of the holdings of outcrop companies to their dip is variable, ranging between 250 and 6000 feet. Those properties having less dip are usually in possession of proportionately greater lateral extent. Properties are almost invariably extensive, and thus ensured a term of mining life sufficiently long to satisfy investors.

The majority of mines are producing and milling ore from two levels, and developing in three—two in free milling, and one in pyritic ore. On sinking the latter in hard rock at the water level (about 150 feet), rock-drilling plants, ranging in capacity from three to twenty drills—dictated by the means at the disposal

of companies—were imported, resulting in more rapid sinking and development of successive levels and the capacity of the mines to furnish greater quantities of milling rock. Additional stamping power is, in consequence, being constantly ordered. The "Robinson" stands at the head of the deeper mines, with 700 feet on the incline.

REEF OCCURRENCE.

The Main Reef series comprises four known beds, viz: The North Reef, one to ten feet wide; Main Reef, one to twenty feet



BOTTOM OF A SHAFT.

wide; Main Reef Leader, three inches to three feet wide; and South Reef, three inches to six feet wide.

The distance apart at which the reefs occur varies, but may be taken generally as follows: Main Reef, one hundred feet south of North Reef; the Main Reef Leader, on the back of the Main Reef; and the South Reef, sixty to eighty feet south of the Main Reef. Each reef consists of one or more beds or veins of banket, frequently differing in size of pebble, and often horsed with sandstone. Those carrying the largest pebbles are invariably the richest.

The Main Reef has five veins (at its widest) of which the

narrowest on its foot-wall carries the best gold. The grade of the whole body is between 3 and 11 dwts. per ton. In a few properties the Main Reef is untouched, awaiting cheaper working conditions. In others it is mined to advantage, together with the Main Reef Leader, which lies on its back, but occasionally with a separation of a few inches of sandstone. Under these conditions six feet width of low grade ore is profitably mined.

The Main Reef Leader, as stated, lies on the back of the Main Reef. Occasionally the dividing sandstone bed widens up to ten feet, in which case the Leader is mined alone with a high grade yield. The majority of its pebbles are as large as a hen's egg, and split. Sometimes pebbles as large as a man's head are found.

The South Reef ranges in width between three inches and six feet, averaging one foot six inches, and has two veins of different sized blanket—that on the foot-wall, with large pebbles, being, as usual, the richer. The high grade yield of this vein and the Main Reef Leader were the making of the Rand, and its mainstay, through its earlier vicissitudes and extraordinary expenditure involved in the establishment of a new industry in a remote region.

During this time the veins with a high grade yield were almost exclusively mined. Gradually, however, as working facilities allowed, the Main Reef has been more generally attacked, with the result that whilst the grade of ore is being gradually lowered, the tonnage and profits are steadily increasing. The results under these heads for the three years, 1890, 1891, 1892, show—

	Tons milled.	Ounces won.	Grade.	
			dwts.	grs.
1890.....	711,877	494,817	13	36
1891.....	1,154,144	729,238	11	23
1892.....	1,979,354	973,291	9	77

DEEP LEVELS.

To the south of the "outcrop" properties, and on the dip of their reefs, are the Deep Levels. Between 2,000 and 3,000 claims are pegged along the entire length of the Rand at distances ranging from 250 to 6,000 feet from "outcrop." These have been partially exploited by diamond drill bore holes up to 1,000 feet vertical depth. The reefs are found in many cases richer and wider than at their outcrop, and their "flattening" invariable.

Deep levels are held by various syndicates and powerful corporations, such as the Rand Mines, Limited, the Rand Deep Levels, Limited, and the Rand Consolidated Deep Levels, Limited, which own some 2,000 claims along the pick of the Rand. They have found it worth their while to buy ground up to 2,000 yards away from the "outcrop," and are now

commencing pioneer operations by sinking large shafts (3 and 4 compartments) to cut the reefs at a first depth of 1,000 feet vertical. These ventures command the greatest confidence in the most influential financial and mining circles, both here and at home, and it is intended to thoroughly develop these mines in preparation for large milling power. They will probably contribute their quota to the output within the next three years.

DEVELOPMENT AND MINE EQUIPMENT.

The mines have been readily developed in soft sandstone, down to the water-line at 150 feet depth, by Kafir hand labour. At the water-line a check was sustained by a temporary excess of water, and by the change of the country to hard blue rock. Adequate pumping machinery having been erected, and machine drills introduced, development has proceeded at about three times its earlier pace.

Mines employing drills are thus gaining on their mills, and preparing for and ordering more stamps.

The well ordered mine is equipped with one or two main hoisting and pumping shafts, as demanded by the extent of the property; one shaft to 1,500 feet on the reef line being about the average. Hitherto vertical shafts, sunk 200 to 300 feet on the dip side of the beds, have been in vogue, but in consequence of flattening of the beds, incline shafts, following their dip, have been more recently adopted. The finest models of these shafts are 20 feet by $5\frac{1}{2}$ feet in section, and divided into four compartments, viz., two main hoisting ways, sinking way and pump and ladder way; and are timbered with 9 by 9 pitch pine sets, and lagged with 2-inch plank through soft rock down to the water line, after which in hard blue rock, lagging is rarely necessary. Incline shafts are sunk by hand at about 40 feet, and by rock drill at 60 feet per month.

Water is caught up and turned into cisterns immediately below the water-line, and pumped up by Cornish pumps of 12 inches diameter, which are chiefly in use, and amply powerful for the wettest mines. These are generally driven by independent engines of compound type. Below this, shafts are practically dry, and consequently there is a tendency in all new work, notably in the inclines, to employ steam pumps in sinking.

Besides the pumps, a complete incline shaft equipment now includes, a high-class winding engine up to 100 horse-power, with three independent drums, fitted with clutch gearing, and hoisting self-dumping skips. A pitch pine 80-foot head gear, equipped with grisslies, sorting floor, rock breakers, ore and waste bins, and the necessary tracks.

Ore is hoisted, dumped, screened, washed, picked for waste, and rough broken at the main shaft, and delivered clean to the mill, which is located as near the main shaft as possible.

MINE LEVELS

are usually laid out one hundred feet apart on the incline of the beds. At these intervals a shaft station is cut, a main cross cut driven to intersect the banket beds, and levels driven on them to both property boundaries. Water and tramways are graded down to the main shaft.

In wide veins, on low grade ore, levels are driven 7 by 5, and a stope drift is run overhead in pay rock. As these drives go forward simultaneously, they are connected at every 50 feet or so by a raise as close as possible to the "face." Those raises in rear are stopped and a free circulation of air is thus created up to the face, and both drift and overhead stope are effectively ventilated. The six-foot rib of ground left overhead roofs the level in place of timber, and forms a floor for the commencement of stoping operations overhead.

In richer veins of one to two feet wide, levels are driven in country rock under the vein, which is subsequently stripped down clean and sent to the mill. Levels are then timbered with three-foot stulls and lagged over with three-inch diameter rough poles to form a floor for the stope overhead. Shoots are now put in every 50 feet to draw out broken ore, and all is ready for stoping. In all cases winze connections between levels are occasionally sunk on the veins to assist ventilation, and to cut up the stoping area into a convenient number of working faces.

The mining of ore for the mill is accomplished by the various methods comprehended under the term "stoping." A stope is a working place on an ore vein. The vein is blasted and delivered through rough timber shoots into cars in the level below. On veins approaching the vertical in sound country rock, "underhand" stoping is employed. All broken rock is sent out, and the ore space vacated by the vein is for the security of the workmen, either kept open on timber props or filled in with rubbish. On flatter veins "overhand" stoping is done, and the same methods of securing safety employed. Veins under 18 inches are "resued" *i.e.*, barren rock is first broken out to make working room, and thrown under foot to fill up the stope and form its floor. The banket is then broken down, and in the case of rich rock on to canvas, whence it is delivered clean into the mill cars. Wide veins dipping under 30 degrees wall fall are taken out by "long wall" or pillar and stall work, and the country finally allowed to fall and fill up old workings.

In the employment of these various methods, necessitated by the manner of vein occurrence and their irregular widths, considerable differences in mining cost are found, and range between 5s. and 15s. per ton. Instancing this, may be taken the operations of two of our leading mines—typical representatives of opposite cases, the one working on high grade narrow veins, the other on low grade broad veins. The high grade mine takes out two veins, aggregating two feet wide, at a cost of 14s. per ton. The low grade mine takes out ten feet, at a cost of 6s. per ton; yet, notwithstanding this comparatively high mining cost, the high grade mine makes four times as much profit per ton as the low.

In dealing exclusively with small veins, the ore output of high grade mines is, however, somewhat cramped, and the general tendency, therefore, is now in favour of expansion by attacking with largely increased milling power the lower grade main reef, which shows improved results as depth is attained, and is now at the lower current rate of working expense more generally payable.

MILLING.

An analysis of pyritic banket ore reveals its constituents thus: Sulphur, 3·38 per cent.; iron, 2·95 per cent.; alumina, 0·55 per cent.; arsenic traces, lime traces, insoluble residue (chiefly silica), 92·75 per cent.; moisture, 0·05 per cent.; gold, 0·0064 per cent.; silver, 0·006 per cent. This analysis demonstrates the exceedingly simple mineralogy of the ore, and the fact of the gold being merely mechanically combined renders it susceptible of the very highest percentage of extraction, as will be shown to be in practice.

The oxidised ore above the water-line is known as “free milling.” It is brown, soft, and slimy, whilst that below the water-line is pyritic blue, hard, and slimy. The proportion of free gold in oxidised and pyritic ores is about 80 and 50 per cent. respectively. The balance of gold is carried in “mechanical combination” with oxides and sulphides of iron.

The method of treatment of both free milling and pyritic ores is consequently comparatively simple, and in both cases identical, thus:—

- (a) Milling and amalgamation of free gold on copper plates.
- (b) Concentration of auriferous oxides and sulphides, and their treatment by chlorination.
- (c) Treatment of tailings by the cyanide process.

By the employment of these methods in combination a nett average return of about 93 per cent. of the ore value is readily obtained.

Various types of mills have been in use here, from the "3-stamp prospector" to the 120-stamp mill, of 950 lbs. per stamp. The most recently ordered mills are 1,000 lbs. per stamp, designed to deal with increasing hardness of milling ore. "High mills" are chiefly built, and in the absence of surface fall, ore is hoisted by vertical and incline lifts from ground level to the topmost "breaker" floor. In other cases, low mills are built, and breakers, grisslies, and ore bins, attached to the main shaft head gear. The most recent designs in this connection provide for "Gates crushers."

Whatever design the local conditions may require, substantial construction and autonomy of working are always amongst its chief essentials, and ore tipped from the mine cars finds its way automatically through grisslies, breakers, ore bins, and feeders, into the battery mortar box. This is fitted with back and front copper amalgamating plates, and a front screen, usually of 30-mesh or 900 holes to the square inch. Here the ore is crushed wet, about half of the free gold is amalgamated on the inside plates, by amalgamation with quicksilver, and the balance on outside plates, four feet wide, ten feet long, and graded downwards at 1 in 12. Thence the pulp, now minus, say, 60 per cent. of its value, passes on to concentrating machines, such as Vruce vanners or Scoular tables, which concentrate from about 15 per cent. of the original ore value, leaving 25 per cent. to run into the tailings.

The "concentrates" form about 2·3 per cent. of the ore bulk, and range in value between four and eight ounces per ton, and are treated by chlorination, with an extraction of 95 per cent.

The tailings are run into dams holding 50,000 tons or so, slimes settled and water drawn off. When fairly dry they are hauled out and treated by the "cyanide process" with an extraction of about 75 per cent.

The duty of a well-ordered mill running on 7½-inch drop, at 96 drops per minute, is 5 tons per stamp per diem, with a water consumption, including concentrator and boiler, of about 240 gallons per stamp per hour.

Mills and concentrators are principally driven by long stroke engines, both simple and compound, and usually non-condensing, on account of pumping expense. Most mills are lit by electricity.

Mill water supply is obtained from natural springs and mine water, and after use is partially settled, and pumped over and over again. Both steam and electrical-driven pumps are used for this purpose as being the more economical.

The cost of milling, including maintenance and pumping, ranges from 3s. 6d. per ton upwards, according to number of stamps employed, and their duty accomplished.



ROBINSON COMPANY'S BATTERY.

[To face page 804.]



CONCENTRATION.

Concentration, or the separation of auriferous matter from its matrix, with a view to subsequent treatment by chlorination, is effected by the use of blanket stakes and percussion tables, the latter being in general use. Of these the Vruce vanner, a well-known concentrator, is principally employed, but has lately met a successful rival in the "Scoular" concentrator—a bumping table with side delivery. Both machines produce from oxidised and pyritic ores concentrates of 2 to 3 per cent. of ore bulk milled, worth from 4 to 8 ozs. per ton.

Taking the profit and loss of concentration on 100 tons of ore milled, producing the lowest grade of concentrate mentioned, the figures are:—

	£	s.	d.	£	s.	d.	
2 per cent. of 4 oz. concentrates, 8 oz. at £4				32	0	0	
<i>Expenses:</i>							
Concentration—100 tons at 6d. per ton	2	10	0				
Chlorination—							
Treatment of 2 tons ... £8	0	0	0				
Plus 10 per cent. of gross value	3	4	0				
				11	4	0	
					13	14	0
Net recovery 57 per cent.				£18	6	0	
Per 100 tons milled. Expenses	£0	2	8·88				
Profit	0	3	7·92				
Total value of ton ...	£0	6	4·80				

On the highest grade mentioned, viz. 3 per cent. of 8 oz. concentrates, a profit of over 14s. per ton milled is realised.

After concentration, the tailings still carrying gold, chiefly in a very finely divided state, and amounting to 20 to 25 per cent. of the original ore value, are treated successfully by the cyanide process, referred to hereafter.

CHLORINATION.

When pyrites were first struck below the water-line and the ore found to yield comparatively little "free gold," the question of how to deal with it could not be answered at once, and as time sped, something very like a scare ensued as to the possibilities of a considerable fall in the future output. Analysis of the ore, however, proved its simplicity, and the presence of the full value of gold to which we were accustomed.

The Robinson Gold Mining Company—the pioneer in the introduction of the best methods of the industry—decided upon its course of action, viz., to mill as usual, and to concentrate and chlorinate the pyrites. They secured the services of an experienced chlorinator from California, who designed, erected, and ran the first works with entire success. These works formed the nucleus of the extensive plant now owned by this powerful company, which consists of four reverberatory furnaces, seven leaching vats of twenty-five tons each, eight precipitation vats, and seven waste liquor precipitation vats. The duty of this plant



THE ROBINSON CHLORINATION WORKS.

is about 2,400 tons of oxidised concentrates, or 900 tons of pyritic concentrates, per month.

The process of chlorination is ably described by Mr. E. P. Rathbone, mining engineer, in an address to the Kimberley Exhibition Conference "On the Occurrence and Treatment of Pyritic Auriferous Ore" as follows:—

"The first, and probably the most important, step in the treatment of gold ores by chlorine is the necessary preliminary operation of roasting, which, it is essential should be of the most perfect character. Many forms of furnaces have been designed, both of the stationary and mechanical revolving type; but, upon the Witwatersrand, only the former has proved successful. The object of roasting is to eliminate, as far as possible, the contained sulphur from the sulphides of different metals, since the sulphides of different metals such as those of iron, copper, lead and zinc will absorb an almost unlimited quantity of chlorine, and it is therefore necessary to eliminate the sulphur and satisfy the affinities of the metals with oxygen. The concentrates are charged into a large bed furnace of a capacity of about nine tons, and are roasted by the heat evolved from burning coal placed at one end in a specially constructed firegrate. The process lasts about twenty-four hours. The sulphur, antimony, and arsenic are driven off and escape through the smoke stack, but the escaping gases are first compelled to pass through a series of dust chambers in which the greater portion of the sublimated metals are deposited, the dust collected

being usually found to contain sufficient gold to render its extraction profitable. Towards the end of the twenty-four hours' roast, about one per cent. of salt is added to the charge, the contained chlorine of which is quickly absorbed by the ore. This is then discharged through the bottom of the furnace into small iron trucks which are run and tipped on to the cooling floors, where it is usually allowed to lie for about twelve hours, sufficient water being added to keep it moist. It is then charged into leaching vats, each of which has a capacity of about 25 tons. These vats are closed with covers in such a manner as to prevent any escape of chlorine gas, which is manufactured in a separate receptacle called a 'chlorinator,' that in use at the Robinson Company having been specially designed and patented by Mr. Charles Butters. The chlorine is transmitted into vats during a period of about twelve hours, and is then allowed to remain in contact with the ore for a further period of forty-eight hours, the total time being varied to suit the character and richness of the particular ore. As soon as sufficient time has been allowed for the chlorine to combine with the whole of the gold, water is turned on, and the gold is dissolved out, passing into solution in the form of chloride of gold. The solutions are then drawn off into the precipitation vats, and as soon as the whole solutions containing the gold have been separated from the mass of sand and iron oxide, these are discharged as waste products. Precipitation is effected by the addition of ferrous sulphate (Fe So 4.) The liquor is constantly tested to ascertain the time required to complete the process, and as soon as this is practically complete, the resulting waste liquors are drawn off into the waste liquor vats, where the precipitation of any small balance of gold still remaining is effected by the use of scrap iron. About every six months the products in these vats are collected, remixed with the concentrates and treated in the furnaces. The gold precipitates are collected and smelted down in furnaces into gold bars in the usual manner."

The pyrites bogey has thus entirely disappeared, and higher gold extraction is now obtained in the pyritic than was formerly got in the oxidised ore. Of the constituents used in making chlorine gas, salt and manganese are obtained in the country, and sulphuric acid is imported; but sulphuric acid works are now in course of erection, with a view to the supply of this chemical.

Metallurgical works, which include chlorination and cyanide plants, have recently been erected by the Rand Central Ore Reduction Company, under the management of Mr. Butters, and are in successful operation. These Custom-works buy concentrates at about 90 per cent. of their fire assay, and make a charge of 80 per cent. per ton for treatment.

The output of the Robinson works for December, 1892, was 4,810 ozs. 8 dwts.

TAILINGS AND TREATMENTS.

After milling and (in some instances) concentration, the tailings carry from 25 to 30 per cent. of the original ore value, in the shape of lost free gold, lost concentrates, float gold, gold in slimes, and coarser gold in insufficiently crushed gangue. By the cyanide process, about 70 per cent. of this loss is recovered in free milling tailings.

The cyanide process under the MacArthur patents is the property of the Gold Recovery Company, Ltd. Its application at the Robinson Gold Mining Company works has been described by Mr. E. P. Rathbone in his address on the treatment of auriferous

ores delivered before the Kimberley Exhibition Conference (see *South African Mining Journal*, No. 19, '92). The tailings are charged into large circular vats (each of seventy-five tons capacity with a bottom discharge), which are then filled with a solution of cyanide of potassium, the strength of which varies according to the richness of the ore under treatment. After the first solution has been run off, the tailings are washed with the weaker solution of cyanide of potassium, which process is continued until the dissolved gold is practically washed out. These auriferous cyanide solutions are drawn off through a filter bed at the bottom of the vats, and conducted through iron pipes to the extracting or precipitating boxes, charged with zinc shavings, which act as the precipitating medium. These boxes are fitted with a tray, forming a false bottom, and when a clean-up is required, the trays are lifted out, the coarse zinc shavings are washed, and the gold slimes passed through a fine mesh sieve, to separate any particles of zinc, which are returned to the boxes. The slimes are then dried, sometimes first roasted, and fused with ordinary fluxes. The bullion thus produced contains a quantity of zinc, lead, and other impurities. The value may be taken at £3 per ounce. The cost of working depends largely on the scale of operations, arrangement of plant, and above all a knowledge of the process chemically. The extraction by this method under favourable conditions may be said to be between 70 and 80 per cent.

In December 1892, cyanide returns from tailings amounted to nearly 15,000 ozs., or over one-eighth of the total output produced from only eighteen out of the fifty-seven active producing companies, and its further more liberal employment on low-grade tailings, with a corresponding increase in the Rand output, seems imminent. For instance, at Langlaagte Estate, where the largest plant is treating 12,000 tons per month, the cost is 5s. 9·787d. per ton. Taking then on 3 dwts. tailings worth 12s.—a net yield of 75 per cent., or 9s.—and deducting 5s. 10d. for expenses, a profit of 3s. 2d. per ton is realised. Under these conditions every ton of tailings lying on the Rand is within reach of profitable treatment by this process.

THE MOLLOY PROCESS.

It will have been observed that under the MacArthur-Forrest patents, the precipitation of gold out of solution is effected through the agency of zinc shavings. It is claimed by the projector of the Molloy process that this method is faulty, and has been in his process improved upon. The difference is in the method of precipitation of the gold from the cyanide solution, which its

projector, Dr. Simon, thus describes: "The affinity of sodium and potassium for oxygen is so great that they will decompose water so very quickly that there would not be a chance for replacing the gold in the double cyanide, and the only method of their practical application is in a finely divided state. This fine division can be obtained by using either sodium or potassium amalgam, instead of the pure metals." The generation of these kinds of amalgam can be easily obtained by means of electricity, and this has been very ingeniously applied by Mr. Molloy. The advantages arising from the use of sodium or potassium amalgam is evident. The gold is replaced, say by potassium, thus forming metallic gold and potassium cyanide, therefore regenerating the formerly used cyanide, and the gold is obtained in the shape of amalgam, the treatment of which to bring the gold into marketable form is known to everybody. The chemical reactions are as follows: The potassium, acting upon the water of the solution, creates nascent hydrogen and potassium hydrate. The nascent hydrogen and potassium hydrate precipitates the gold, leaving hydro-cyanic acid. The latter continues with the potassium hydrate of the former reaction, thus forming cyanide of potassium.

Practical extraction of 72 per cent. has been obtained by this process, which is still on its trial.

By the employment of the various methods of gold extraction detailed a total recovery of about 90 per cent. is realised, thus:—

	Contents.		Extraction.	
By amalgamation	60	per cent.	...	60 per cent.
In chlorination of concentrates,				
95 per cent. of	10	"	...	9·5 "
In cyaniding tailings 70 per				
cent. of	30	"	...	21 "
	<hr/>			
	100			90·5

CYANIDE LOSSES.

The cyanide loss of 25 per cent. occurs chiefly in slimes, which constitute from 25 to 33 per cent. of the bulk, and carry about the same value per ton as the coarse sands; in other words, the slimes carry one-third of the total gold. When run into the tailing pits these slimes pack into solid cakes, which in the cyanide vats are absolutely impermeable by the cyanide solution. As a consequence their surfaces yield only a small per cent. of gold, the balance is discharged from the vat as rich as it came in, and a regular loss of something like 25 per cent. is the consequence. It is proved, as pointed out by Mr. Rathbone, that if a fair proportionate distribution of tailings and slimes could be

made in the vats, so as to secure easy filtration, higher extraction could readily be got. This condition is contingent upon proportional delivery in the first instance into the tailing dams, which hitherto has not been successful. Partial failure in this respect has led to experiments in the direction of primary separation of slimes and tailings by hydraulic methods, and their subsequent treatment independently; and experimental runs on slimes with cyanide through a filter press, conducted by Dr. Simon and Mr. Bettel, chief chemist of the Robinson Company, have proved successful, and it is understood that the method will be brought into practice. Upon the successful treatment of slimes now depends any increase in the percentage of extraction by the cyanide process, and its addition to the present total of extraction by the combined processes of amalgamation, chlorination, and cyanide, which now stands at about 90 per cent.

COST OF MINING AND MILLING.

The cost of mining and milling ranges between 40s. and 12s. 6d. per ton, and is usually governed by the size of the veins mined, and consequent scale of milling. The prominent companies of Robinson and Langlaagte are representatives of the opposite cases of mining in narrow and wide veins respectively, with a wide difference in cost, as shown by their last three months' return to December, 1892:—

		Robinson.	Langlaagte.
Width of veins mined	...	2 feet.	10 feet.
Stamps employed	...	60	120
Tons milled...	...	23,980	53,994
<i>Expenses per ton—</i>			
Mining	...	14s. 3·4d.	8s. 6·179d.
Mine development	...	8s.	0s. 3·939d.
Tramming	...	...	0s. 2·474d.
Milling	...	4s. 1·45d.	2s. 11·017d.
General maintenance	...	0s. 6·89d.	...
General charges	...	2s. 7·55d.	0s. 9·001d.
		£1 9s. 7·29d.	£0 12s. 8·619d.
<i>Revenue—</i>			
Total Receipts	...	£82,886 9 3	£57,007 3 9
„ Outlay	...	35,500 8 7	34,337 4 11
Total Profit	...	£47,386 0 8	£22,669 18 10

The economies of the two mines demand entirely different measures; efforts in the Robinson being made to mine their thin and rich veins to as high a grade as possible, whilst Langlaagte tackles a lower grade proposition with large bodies of ore, cheaply mined. The Robinson spends over twice as much per ton, but, *with half the milling power*, makes over twice the profit of Langlaagte. So far as mining and milling are concerned, similarly varying conditions prevail to a great extent all along the Rand mines.

MACHINERY, LABOUR, &c.

The Rand is provided with a mixture of modern high-class machinery, and the remnants of machines dating from the pioneering days. In this connection, the finest gear obtainable in all branches is now invariably laid down.

English and American makers are keen competitors. In Rock Drill plants, America stands first with Rand and Ingersoll's plants; and in mills the competition is very close.

Mills have hitherto been weighted at 850 lbs. per stamp, but are now ordered up to 1,000 lbs. to contend with increasing hardness of the rock. Mine pumping plants are chiefly Cornish Pumps 6-12 calibre, driven by independent engines of compound condensing type. Winding-engines range up to one hundred horsepower nominal, double cylinder and geared on to drum shaft carrying two loose drums thrown in and out of gear by two independent clutches. Many winding gears will soon be out of power, and are being replaced with powerful engines calculated to carry the mines down to their greatest required depth. Proportionate head-gears are now being erected, and Gates' Crushers introduced.

Of boilers, the locomotive, return tubular marine, and Babcock and Wilcox type are in use (the two latter being preferred), and are occasionally fitted with fuel economisers, self-stoking and cleaning appliances.

Most mines have a range of workshops, including smiths', fitters', and carpenters' shops, with an equipment of tools by English makers, and in the case of the Robinson Gold Mining Company, a foundry, where everything required, except shoes and dies, cams and tappets, is cast. Generally, the Rand may be considered as fairly equipped up to present requirements, and progressive in the matter of machinery.

There has been a good deal of electrical work done in Johannesburg, most of the mines being provided with electric lighting plants, and several having availed themselves of electricity for pumping and similar purposes. The three principal firms carrying on general electrical work are (1) Howard Farrar & Co.,

represented by Mr. J. Hubert Davis, agent for Crompton & Co., London; (2) The Electrical and General Engineering Syndicate, agent for Scott & Co., Newcastle, England; and (3) Woodhouse & Rawson United, Limited, of London, represented by Mr. R. Lewis Cousens. An idea of the amount of electrical lighting may be formed from the fact that one of the above firms has alone provided plants totalling a capacity of about 8,000-candle power lamps. Besides lighting, some companies have electrical transmission in constant use, both above and below ground, and it is only a matter of time before electricity will take the prominent part that it should in mining operations.

Johannesburg town has also a central lighting station on the alternating current system, with a present capacity of 2,500 8-candle power lamps, and plant on the way for a very considerable extension.

In regard to labour, white miners are paid £4 10s. to £6 per week, and smiths, tool-sharpeners, fitters, and carpenters from £5 to £6 per week. The supply of both miners and mechanics is, in skilled men, barely equal to the demand. Tool-sharpeners able to sharpen rock-drill bits are scarce, and readily command £1 a shift.

The Native population working at the mines is estimated at 35,000, and still the number is complained of as inadequate. The Kafirs are employed at an average cost for wages of 15s. per week, and for maintenance, 3s. per week. Efforts are being made, however, to reduce Native wages to an average of 40s. per four weeks, which would represent a saving to the industry of £150,000 per annum.

Excellent local coal is delivered in sufficient quantities at 17s. to 20s. per ton. Under fair conditions it is consumed with a yield of 6-horse power per hour. Local mining timber costs about 2s. to 2s. 6d. per foot all round, and is in fair supply, but it is as little used as possible beyond stalling and lagging for levels.

The country abounds in natural springs, and copious rains fall in the summer half-year. On mines where reservoirs are built to conserve the rain, scarcity of water is unknown.

Imported supplies are landed here by railways at an inclusive importing cost of 40 per cent. on invoice, and delivery got within eight weeks' despatch from London.

Imported and Colonial goods necessary to the industry and living are most unduly taxed by the Government, and costs on both heads are in consequence still excessive. Bare necessities cost the working man 30s. per week.

The general conditions and facilities, however, now surrounding the industry are favourable to cheap working and the readier development of our enormous resources.

CHAPTER XXVIII.

THE COAL FIELDS.

BY ERNEST WILLIAMS, ASSOC. M. INST. C.E.

THE coal measures of the South African Republic (Transvaal) comprise the uppermost series of stratified rocks occupying the greater portion of that part of the country known as the High Veldt, extending from the Vaal River on the south to Middelburg on the north, and from the eastern end of the Witwatersrand on the west to Ermelo on the east. The general altitude of the country is about six thousand feet above the sea-level.

The coal formation consists of a series of beds of coarse sandstones, shales, and clays, with local beds or deposits of coal of varying extent, thickness, and character. The maximum thickness of the measures so far as proved is about two hundred feet. The rocks of this series are for the most part in a fairly horizontal position, and are generally found to rest unconformably on the quartzites and conglomerates which form the gold-bearing rocks of the Witwatersrand. The predominant and most persistent rock of the series is the sandstone, which is generally of a very coarse and massive character, and usually overlies the coal seams, or deposits of coal, and is easily traceable over nearly the whole of the area above mentioned. Owing to the absence of fossil remains the geological age of these rocks is a matter of doubt.

In some districts the deposits of coal are so numerous as practically to form a continuous bed over a large area of country. In most cases the main seam of coal is of considerable thickness; in many places being over twenty feet thick, ten feet thickness of clean coal being very common.

The coals are of very fair quality, and well suited to the general requirements of the country. Portions of certain seams would make a very serviceable metallurgical coke if properly prepared and treated, but so far the coke produced is not good enough to compete with English coke for smelting purposes.

The general conditions under which the deposits exist indicate that the coal is of subaqueous origin, or drift coal. The coals are generally of the dry semi-bituminous class, intermixed,

in most cases, with coal anthracitic in character. The coals vary very much in different localities, and in many cases in different portions of the same bed or seam. The coal from some districts is free burning, from other districts it is quite the reverse. Usually two or more seams are found separated by bands of shale, varying in thickness from a few inches to several feet. As a general rule the thicker seams are in the lower portion of the measures.

The most extensive deposits are those of the Oliphants River and Wilge River district, in which the coal is found outcropping in the river bed, and in no case is coal known to exist at any considerable depth. The existence of these deposits has been known for a very long period, and it is probable that they were the earliest discovered coal beds of any extent in South Africa. Until recent years no systematic working of the coal was attempted, as the small quantity of coal required for local use was easily obtained from the bed of the river or stream during the winter or dry season. In this district there are a great number of collieries open and working at the present time, though on a small scale. The coal is the best produced in the Transvaal, if not in South Africa, and is much sought after for household and smiths' use, and a small quantity is used for making illuminating gas in Johannesburg. The principal market for the coal is the Witwatersrand. This coal cannot successfully compete for the Rand steam coal trade, owing to the cost of transporting it by waggon for a distance of seventy to ninety miles. The total annual production of coal from this district at present is about fifteen thousand tons.

The Delagoa Bay Pretoria Railway will pass through this part of the country, and it is very probable that with the opening of the line the coal trade of the district in the immediate vicinity of the railway will increase to an enormous extent. The coal will be transported to Barberton, and will materially affect the working of the mines in that district, and doubtless very large quantities will be used for steam-raising in the various mines which cannot be profitably worked at present owing to the difficulty of obtaining cheap motive power.

Coal will also be transported to Delagoa Bay to be used as bunker coal for steamers, and it is probable that a large export trade will arise, the Middelburg coal being equal or superior to any other South African coal. The Oliphant's River and Wilge River district is destined to become the premier coal-producing area in South Africa.

The next important discovery of coal was made on the Vaal River near its junction with the Klip River, about thirty miles

south of Johannesburg. Here a thin seam of coal was found in the bed of the river, and prospecting disclosed a lower and thicker seam of very good coal. For some years very little work was done, but on the discovery of the Rand Gold Fields, work was vigorously carried on and large quantities of coal sent to Kimberley and to the Rand Mines, where it obtained a ready sale. A large amount of money has been expended on the equipment of the colliery which is near Vereeniging Station on the Free State-Transvaal Railway. The opening of the railway from Cape Colony to Johannesburg gave a great impetus to the trade at this colliery, and at the present time the output is about 8,000 tons per month, the greater portion of which is used on the railway and other works south of the Vaal River, while the remainder is used on the Rand for steam, household, and smiths' purposes.

In December, 1887, coal was found upon the proclaimed ground, Vogelfontein, at Boksburg, about twelve miles east of Johannesburg. The seam, or deposit, was met with at a depth of fifty-one feet below the surface, in a shaft sunk for exploiting the Main Reef series of beds which outcrop some little distance to the westward. At the point where it was first struck the coal was fifteen feet thick. Systematic coal-mining was immediately commenced, and for a short time the coal was sold in Johannesburg at the rate of 10s. per bag of 200 lbs. weight. The ground being proclaimed, or public diggings, it was soon pegged off in claims of the same area as gold (quartz) claims, viz., four hundred feet by one hundred and fifty feet.

The whole of the Boksburg coal field is held under ordinary mining licence from the Government. A number of companies have held and worked blocks of claims since discovery of coal, and for a time these companies were the principal producers in the country.

The Boksburg deposit is a small outlier of the general series, and is of only limited extent; it is, even yet, being worked in a somewhat primitive manner by about ten different companies. The annual yield of coal is nearly 50,000 tons, of which nearly the whole is used on the Rand for steam purposes, and the remainder sold for household use. The coal is of a dull anthracitic character, and requires a strong draught to obtain efficient combustion. It leaves a large amount of ash.

The life of the Boksburg coal fields at the present rate of extraction will be very limited. Underneath the coal-beds the Main Reef series of conglomerates have been proved, and it is probable that in the near future the claims will be worked for gold.

The Boksburg seam is the only known deposit in proclaimed Government ground in the Transvaal.

In searching for the Main Reef series to the east of Boksburg further discoveries of coal were made; first, on the farm Brakpan, and afterwards on adjoining farms. Immediately on the finding of coal at Brakpan active coal-mining operations were commenced, so that now Brakpan holds the position of the premier coal-producing pit in South Africa, with an annual output of 198,000 tons.

For several years the whole of the coal raised at Brakpan was



BRAKPAN COAL MINE.

despatched to the Rand by ox and mule-wagons, a method of transport, at once cumbersome and expensive. In 1890 the Rand tram was carried through Brakpan Farm, and in 1891 a branch railway was built to the Brakpan Pits, thus placing the colliery in direct communication with the gold mines. The result of this connection has been that the property in the hands of the Transvaal Coal Trust has become one of the most extensive and profitable concerns in South Africa. The Company owns the freehold of the farm extending over an area of over four thousand acres, the greater part of which is coal-bearing. The present capacity of the Brakpan Colliery is 1,000 tons per day.

The main seam of coal is from 15 feet to 20 feet in thickness and yields an excellent steam coal.

The following is a section of the strata at this colliery :—

			Feet.	ins.
Surface soil	...	...	16	0
Clay	...	...	23	0
Sandstone	...	...	41	0
Shale	...	...	5	0
Coal	...	...	2	8
Shale	...	...	9	0
Coal	...	...	21	0
Shale	...	...	3	6
Sandstone	...	...	2	0
Brecciated quartzite	and			
pebbles	...	...	3	6
Quartzite	...	...	3	4 not through.
Total	...	...	130	0

About six miles east of Brakpan is the Springs Colliery exploited by the Rand Tram Company (Nederlandsche Zuid Afrikaansche Spoorweg Maatschappij). This colliery has been laid out in the most approved German manner, and is capable of raising 100,000 tons of coal per annum. The seams of coal being worked have an aggregate thickness of five to six metres; the coal produced is a good locomotive fuel, and is extensively used on the railway locomotives. This deposit is of very great extent, and is being worked upon the adjoining farms by several small companies, having an out-put of several hundred tons of coal per month.

The Rand Gold and Coal Industries are largely dependent one upon the other, and were it not for the singular disposition of fuel close to the gold fields many of the gold mines would not be worth working. The large demand for fuel for the Rand enables coal owners to mine large quantities and supply coal at low rates. The average selling price of coal at pit-mouth at Boksburg is eight shillings; and at Brakpan, twelve shillings per ton of ten bags, each containing two hundred pounds. The cost of transport by rail is twopence per ton per kilometre, making the average cost of coal to gold companies about twenty shillings and sixpence per ton, taking Brakpan as the standard.

The method of mining generally followed is either Bord and Pillar, or Pillar and Stall; the former being the more common. The whole of the mining work is done by Kafirs, with white men as overseers; the natives make very fair miners when properly

instructed. All the larger collieries are worked by means of vertical hauling shafts with double cage-ways. Trucks of 10, 12, 16 and 20 cubic feet capacity are used. Nearly all the mines have adopted the 18-inch gauge tramway so common in all South African mining districts. Owing to the high cost of timber very little is used in the coal mines, it being cheaper to leave pillars of coal to support the roof. The mines are not heavily watered notwithstanding their shallow depth. Fire-damp is practically unknown in any of the mines, consequently naked lights are used.

From an industrial and commercial point of view the Transvaal coal deposits are of great value, situated as they are, close to important and increasing markets, with a yearly production of over four hundred thousand tons. The industry is only in its infancy. The coal measures contain about fifteen thousand million tons of coal, besides immense quantities of fireclay and building stone of great value and importance. With cheaper transport rates, communication with East Coast ports, and modification of carrying arrangements, so that coal can be carried in bulk instead of in sacks, the cost to consumer will be greatly reduced, and further uses found for the coal as new markets are opened up.

CHAPTER XXIX.

THE SILVER MINES.

BESIDES gold and coal, deposits of silver, copper, lead, and iron have been found to exist in the South African Republic, and there is a fair prospect of an important smelting industry being established in the not far distant future. The great drawback at present is the lack of a supply of local coke. From time to time, highly successful experiments have been made in the manufacture of coke from Transvaal and Natal coal, but one cannot so far regard them as more than experiments, and the silver-mining companies have in the meantime to recognise that, pending the achievement of practical results on a much larger scale than heretofore, they must make shift by concentration to reduce the bulk of ores, whether for shipping or smelting on the spot.

As far back as 1867, Mr. E. Button, already mentioned as one of the pioneers of gold-mining in the country, discovered silver ores on the property now known as the Transvaal Silver Mines, and about 1875, Mr. E. Bray (afterwards discoverer of the Sheba Quarry) worked argentiferous galena deposits in the Marico district for some years. At irregular intervals, other deposits were reported, and in 1885 the Albert Mine was discovered, where some prospecting work was done by the owners, and later on a private company or syndicate was formed to develop the property, which may be considered the first serious effort at silver-mining in South Africa.

The Albert Mine, Limited—which has a capital of £100,000—is situated about 50 miles north-east of Pretoria, on the freehold farm Roodepoortje, 8,913 acres in extent, the whole of which is the property of the company. In the early history of this mine the mistakes, seemingly inseparable from first mining ventures in new countries, were made; the working capital was inadequate, and the management inexperienced. The original shareholders, however, were convinced of the value of their property and held on until it was possible to reconstruct upon favourable terms, with the result that during the last two years a considerable amount of work has been done, and the Company has now entered on actual production.

The reports of geologists upon the property state that the

country rock is "a compact reddish granite, traversed by veins of quartz and pierced repeatedly by intrusions of intrusive greenstone rocks. South of the Company's property the granites are overlaid by a series of quartzites and quartzose mud stones, passing upwards into silicious sandstones containing local beds of coal. These coal beds occur at a distance of five miles from the Albert mine, but have not yet been opened up; however, about twelve miles south lie the extensive workings of the Holfontein and Klipfontein collieries. The metalliferous deposit on which the present workings are being carried out has every appearance of being a true fissure vein, striking east and west, over 100 feet in width, and having a lateral extent of 1,500 feet as traceable on the surface. It is easily distinguishable by its massive capping of hematite iron, about forty feet in width. Parallel with this, and about 600 feet to the north, there is a second lode, similar in appearance to the above. Comparatively little work has been done on it as yet, but it is known to be of very great width; and in this, as in the first-mentioned lode, the iron ore, which constitutes the outcrop, carries silver and copper in all cases.

From the workings in the first lode a large quantity of very rich ore has been extracted, mostly bornite, or purple copper ore, with grey copper, and a little copper pyrites; also hematite and specular iron ore, carrying silver in very large quantities. Picked samples of this class of ore run extremely high—at times over 1,000 ounces to the ton.

The vein structure is not well defined, owing to the great crushing and dislocation of the rock, resulting from the faulting of the granite; but the south wall, at least, is definitely marked by an edge of white granitic clay. The general mass of the huge mineralized body is composed of quartzose hematite iron ore; and although no part of either the copper or hematite iron ore is entirely barren of silver, the yield is very variable across the 100 feet width, to which the lode has been proved so far. Throughout this huge body there occur bunches of argentiferous copper ore, but the developments at the 50 feet and 150 feet and 230 feet levels show that within this mass there are two well-defined seams of rich ore, and the work has for some time been confined exclusively to these portions.

The first seam or vein, as it might for convenience be called, lies adjacent to the south wall of the lode, and varies from 3 feet to 5 feet in width, having a value by assay of 45 ounces silver and 10 per cent. copper per ton. Next to it there is a considerable but varying width of lower grade, but still payable, concentrating ore. No. 2 seam lies 25 feet north of No. 1, and is of a similar

description. It is 2 feet thick, and has a silver contents of 40 ounces per ton.

The above seams have been cross-cut at the 50 feet and 150 feet levels, and are now being opened up by extensive drifting. At the latter level the ore is of high quality—a 3 ton average sample of No. 2 seam ore giving a result of 60 ounces silver and 14 per cent. copper per ton. The main shaft is down 230 feet, at which depth the third level is now being opened up, and it is anticipated that the main shaft will attain a depth of 400 feet during the current year. The mine is deemed capable of a monthly output of 1000 tons of ore from the two rich seams as exposed in the two levels opened up at date.

At the beginning of 1893, reduction work was commenced. A twenty-stamp battery, of 850 lb. stampers, was used, the ore passing through 550 mesh screens and ordinary copper plates, where, it is claimed, a fair proportion of metallic silver is caught. The pulp is passed over three different styles of concentrators—the first being the Scoular's tables, the second Vruce vanners, and the third jiggs. Fifteen hundred tons of ore are now being treated, and yield about 300 tons of concentrates. These concentrates are reputed to contain 70 oz. and 12 per cent. of copper per ton, and are at present shipped to England for treatment. Two bars of smelted silver from the mine have been presented to the Government of the Republic; and experiments are being made at the Pretoria Mint with a view of extracting mintable silver out of the concentrates.

The next silver locality is that in which the Willows, Willows Estate, the Oaks, Mundt, and others are situated, but the limits of this article will not permit of a detailed reference to each of them. The property of the Willows (Argentiferous Syndicate, capital £120,000) is situated some nine miles east of Pretoria, and may be taken as representative of the district, being equidistant from the Albert on the one side and the Transvaal Silver Mines on the other. The geological characteristics differ widely from those of the last-named mines. The country in which the argentiferous lodes here occur consists chiefly of diorite and clay-slate, with dolomite and limestone in small quantities, and the lodes are described as contact veins, occurring between a hanging wall of diorite and a footwall of slate.

During two years an amount of over £80,000 was spent on the property chiefly in development, machinery and experimental works, but the methods thus adopted proved unsuitable for ore of that class and quality, the presence of large quantities of antimony and other refractory ingredients making the successful treatment of it a very difficult matter with such facilities as were then

available. The funds of the Company were not equal to another series of experiments, or a protracted period of unproductive work, and the reduction works were shut down.

At various times tests on a fairly extensive scale were applied to ascertain the value of the ore, and very satisfactory results were obtained, but the processes differed from those adopted on the mine. Ninety tons of ore from No. 2 reef were shipped to Swansea for treatment, and a gross value of £22 per ton was obtained, or a net profit of £13 per ton after payment of all expenses. From No. 4 reef shipments of 150 tons were made, the gross value received for which ore was £24 per ton. The ore is described as consisting of carbonate of copper interspersed with pyrites in No. 1 reef, and in No. 2 in the upper levels it is green and blue carbonate of copper changing at greater depths into sulphides.

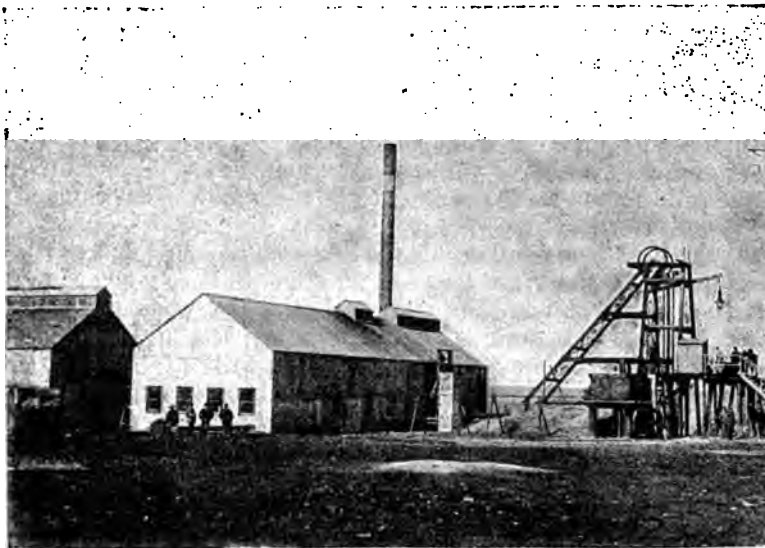
Lodes Nos. 1, 2 and 3 are opened up at two levels, giving backs of 70 feet each. On No. 1 lode there is 300 feet of drifting, and an average thickness of three feet of ore body is exposed. On No. 2 lode 700 feet length of vein has been opened up in the two levels and a body of ore five feet in thickness exposed. From this lode a profit of £13 per ton on shipped ore was realized as above stated. Reef No. 4 has been opened up by 1500 feet of drifting on the two levels, and the ore body has an average thickness of three feet. The shipment of 150 tons as mentioned realized £24 per ton, and there appeared to be every prospect of great success before the Company when the want of capital prevented them from profiting by their experience. The mine is now let on tribute for a period of two and a half years, with the option of renewal for the same term.

The country for very many miles round is reputedly argentiferous, but it is not until "The Transvaal Silver Mines, Limited" are reached, some forty miles to the eastward, that one again finds work proceeding on anything like a large scale. This property is considerably over 8,000 acres in extent, besides which the Company holds a long option of purchase over another large area, through which the silver lodes are believed to run. The mine is situated in the district of Pretoria, fifty miles east of Johannesburg and six miles from the coalfields. Although prospecting work has exposed a number of lodes, more or less highly mineralised, only two of these have heretofore been worked to any considerable extent. These two lodes are about a mile apart, and the other veins occur between these two, running parallel with them, and having continuous outcrops of promising appearance.

The two main lodes, known severally as the "East" and "West," are composed of massive seams of argentiferous galena

mingled with small quantities of lead, copper, iron, and antimony ores, with quartz and carbonate of iron as gangue. All the ores in this neighbourhood maintain this character without appreciable variation, and are easy of treatment.

It is now two years since, upon the report of Mr. Hennen Jennings, mining operations were commenced in earnest; and a vast change has been wrought in the condition of the Company's property. The place, once bleak and deserted, presents now an appearance of life and business eloquent of the faith and energy of the management. The mine is worked from one main hauling-



TRANVAAL SILVER MINES' WORKS.

shaft, which has now reached a depth of 330 feet vertical, opening up levels at 130, 230, and 330 feet.

On the West lode there have been a number of incline shafts sunk upon the course of the vein, proving a productive continuity laterally of over 2,000 feet. Various depths have been attained in these winzes, and the sampling of the lode, as exposed in them and in the first level, gives a result of thirty-four ounces silver and twenty-six per cent. lead per ton from a body of ore averaging $3\frac{1}{2}$ feet in thickness. On the second level (230 feet) the lode shows an average thickness of six feet. Throughout the mine, owing to the cost of mining timbers, the drift stop principle has been adopted; solid strips of lode, five feet in thickness, are left

as pillars, roofing the main galleries, pierced at intervals of fifty feet by passes.

At the 130 feet level, where the greatest extent of lode is opened up, the main drifts are now 850 feet in length, and as the results obtained are in every way satisfactory, it is anticipated that the pay shute of the lode will correspond at this and other level, with its surface extent of 2,000 feet, as proved by the shafts already referred to,—in which case the productive capacity of the mine would be enormously increased. The load varies in the first level from $3\frac{1}{2}$ feet to eleven feet in thickness, but in the second level is more uniform, and varies little from six feet.

Assay results throughout the mine are fairly regular, and it is a noticeable feature that although the proportion of galena in the lode matter may vary at times, the relative proportions of silver and galena do not alter. The results of local tests, together with those obtained in Europe from shipped ore, indicate the great specific gravity of the ore, six cubic feet of lode matter in the solid representing one ton weight of ore, of a metal value of ten pounds sterling.

On the East lode another mine is being opened up; but as the development of the West lode was for some while as much as the Company could at one time cope with, the East lode remained untouched, and the work is necessarily much less advanced. A working shaft has however now been sunk to 100 feet depth, at which point a level is being opened up, and drifts are in north and south about 100 feet. Steam hauling and pumping machinery has been erected, and development will be prosecuted on lines similar to those laid down in the West lode. The vein at this 100-feet level is $2\frac{1}{2}$ feet in thickness, and contains an 8-inch seam of solid galena, with irregular distributions of galena throughout the rest of the lode.

It has been the policy of the Company to ship as much first-class assorted ore as the facilities for transport admitted of. This assorted ore is practically base bullion, and up to March 31st, 1892, 940 tons had been shipped of an average value of 71·5 per cent. lead, and ninety-one ounces silver per ton, yielding a profit of £17 5s. 9d. per ton.

Recently, reduction works were erected, and smelting operations carried on at the mine, imported coke being used, and considerable profits being the result. But the ore was found to contain a larger proportion of sulphur than was at first supposed, necessitating the erection of furnaces for de-sulphuring; and it was found that greater profits could be made by concentrating the ore, and shipping the concentrates, than by smelting. A com-

plete concentrating plant is now in course of erection, and will be at work before the close of the year, when it is probable that the scale of operations will be more in keeping with the capabilities of the mine.

In the earliest days of the silver industry, when the extent of the "belt" was unknown, it was urged in support of adverse opinions that mineral deposits of any value seldom exist in isolated spots. If the converse of this—extent of mineralized area, and continuity of lodes—be accepted as evidence of probable value, there is now much to be said in favour of the silver deposits of the Transvaal. The lodes on the property of the Transvaal Silver Mines are traceable for miles on either side, and a great deal of prospecting work has been done in the neighbourhood. The country appears seamed with parallel lodes, some of which carry a valuable proportion of galena, while others are barren of all but the merest trace of mineral. Of the properties which have not yet passed the prospecting and developing stage and become regular ore producers, those of the Witpoortze Syndicate offer an example. The Syndicate owns property, in extent 10,000 acres, embracing the farms Boschpoort Nos. 1 and 2, and portions of Brakfontein and Witpoort. On Boschpoort No. 1, which is situated four or five miles south of the Transvaal Silver Mines Company's property, there have been discovered seven clearly defined parallel lodes, two of which carry a payable proportion of galena. On these two, shafts have been sunk to a depth of 150 feet, and a lateral extent of over 300 feet of lode opened up. The two lodes exposed in these workings are 14 feet apart, and average samples taken at the 150-foot level from the entire lode, as far as exposed, have yielded from No. 1 reef 202 ounces silver and 78 per cent. of lead, and from No. 2 reef 80 ounces of silver and 70 per cent. of lead per ton. A small shipment of galena from these two lodes was made for purposes of testing; it was assayed to yield 177 ounces silver and 70 per cent. lead, and realised in London £38 per ton. The prospects of this lode were considered sufficiently good to warrant work on a large scale, and a main working shaft in three compartments, timbered with 6 in. by 6 in. pitch-pine and lagged, has been sunk to the 150-foot level, and equipped with the best steam hauling and pumping machinery.

On Boschpoort No. 2 and Brakfontein work of a similar nature is being done. On the latter farm the lodes are traceable by outcrops for a mile and a half continuously. The ore bodies here, although not as rich on the surface as the above, are very much larger, varying from six to eight feet in thickness. Lately, some very promising ore has been struck, but until the first level is

reached and opened up no extensive tests of value can be made. The work, which has been for some considerable time retarded by influx of water, is now being rapidly pushed on.

On the neighbouring property—Groenfontein—rich strikes, similar in many respects to the above, have been made, and a large amount of capital is being expended in the opening up of the lodes. On these and other properties in this neighbourhood fresh discoveries are being constantly made, but, much as has already been done in the way of development, it is insignificant compared with what should, and no doubt will, be done. When the more advanced of the mines succeed in attracting the public attention, there is every reason to expect that an immense industry will develop in the district.

It is, perhaps, too early to speak of silver-mining in the South African Republic as a rival of the great sister industry at Witwatersrand, which has in six years outstripped all other enterprises in South Africa, and placed the Republic in the very foremost rank of mineral producing countries; but it is worth while to examine the data given. Over a belt of country some thousands of square miles in extent, indications of the presence of silver have been met with. In some localities development has been prosecuted with great success, when favourable conditions, such as the command of capital and skilled direction, obtained. In other places the discoveries are of a very recent date, and the work is of too meagre a character to warrant the expression of opinions or the framing of estimates, but prospects so far are as good as, and often better than, those which marked the earlier stages of work in the best of mines. In other parts, again, there have been difficulties to contend with, other than those of actual work, which have hindered the development of properties having in them all the elements of success. In nearly every case, however, the actual mining work has warranted the confidence which is now felt and shown in the silver mines as legitimate and highly promising undertakings.

CHAPTER XXX.

THE PORTUGUESE POSSESSIONS.

THE Portuguese colony of Mosambique (constituting the Estado d'Africa Oriental) is divided into two Provinces, viz., that of Mozambique, north of the river Zambesi, and that of Lorenzo Marques, embracing all south of the Zambesi. The total area of the East African possessions is estimated at 271,600 square miles, and the population at 1,500,000, of whom about 400 are European British subjects. The value of the yearly imports are about £750,000, and the exports do not exceed £300,000. Both the resources and the commerce of the country, however, are susceptible of great development.

Quillimane, a pleasant oasis in a wilderness of mangrove swamp, has hitherto been the principal port for the Zambesi district; but the Chinde River mouth of the Zambesi—where a township is springing up—is now largely made use of for conveyance to and from the British Central Africa and Nyassa territory. Goods imported or exported at Quillimane in transit to or from British territory are liable to a 3 per cent. *ad valorem* duty, while those imported by the Zambesi are free of duty. British steamers have on several occasions called at Chinde and landed goods and passengers there; and small cargo steamers of the African Lakes Company run between Chinde and Chilomo on the Shire. They carry up cargo and passengers and bring down coffee and ivory from the Shire Highlands and Lake Nyassa, and oil seeds from the Zambesi. At Quillimane, the value of imports in 1891 was £156,832, and of exports £112,000. In the same year about £15,000 worth of goods was sent to the interior from Chinde, and about 30,000 lbs. of ivory exported without paying Portuguese duties. Transport by the Zambesi to Senna and Tete is by means of lighter boats and canoes, all of which run the risk of being capsized by wind and hippopotami. From Tete to Salisbury in Mashonaland is nearly ten days' march, and steamers can run from Chinde to Tete in eight days.

Coal beds are found along the banks of the Zambesi river, about twenty miles above Tete, and some of the Portuguese river steamers use it.

Agriculture is carried on, but on a limited scale. Each native

hoes and cultivates his own little patch of ground. The crops grown are rice, different kinds of beans, maize, millet, peas, sesame seed, ground nuts, and in the cold weather most European vegetables. The fruits produced are mangoes, oranges, limes, lemons, guavas, grapes, pine-apples, pomegranates, and custard apples. Vigorous efforts are being made to grow sugar-cane, and coffee as well as pepper, vanilla, and sea island cotton. Domestic animals are represented by a few horses, donkeys, cattle, goats, sheep, pigs, and poultry. Horses do not thrive, but donkeys and mules do well. There are not enough cattle, sheep, and goats to maintain a supply of butcher meat, and poultry forms the staple article of diet. Fish of an excellent quality are caught near the sea, but only in small quantities.

Some important portions of the country have been granted to companies under concession. That granted to the Mosambique Company, which has its headquarters at Port Beira, extends from the Zambesi on the north to the river Sabi on the south, covering an area of about 60,000 square miles. This company is established under royal charter from the King of Portugal, giving sovereign and administrative rights over the territory of the concession, including mining, agricultural, industrial, and commercial undertakings, or whatever may develop the wealth of the country. It is under the obligation to provide for the settlement of 1,000 Portuguese colonists in the area of the concession within a period of five years, and to construct the railway from Pungwe to the frontier of Manica, passing through Massi-Kesse. Another company has bound itself to construct a railway from the Indian Ocean to the shore of Lake Nyassa in seven years; and another company, which has a concession from the Sabi River to the Limpopo, engages to construct a railway from the Limpopo to the frontier of the South African Republic in five years.

The first section of the Beira Railway, From Fontesville to near Chimoyo's, a distance of about seventy-five miles, is just completed, affording facilities for the transport of mining machinery and supplies to the gold-fields of Mashonaland. This will give an impetus to the shipping trade at Beira, where there is a good safe harbour, which can be entered by vessels of large tonnage. The starting-point of the railway, at Fontesville, is about forty miles up the Pungwe River from Beira, and passengers and goods are conveyed this distance by steam-tugs and lighters, under the management of an English shipping company. The country in the neighbourhood of Beira is full of game; buffalo, wildebeeste, hartebeest, and quagga are found in vast herds, and sometimes lions and elephants are met with; but the climate in the summer season is malarial in parts, and infested with the

tsetse fly. It is to bridge this latter tract of country that the railway has been constructed.

The old town of Sofala has fallen into ruins, but it is proposed to have it rebuilt and named "Villa Nova de Sofala." Chiloane and Inhambane are the other settlements on the coast. South of Chiloane, in the Bazurutu islands, there are reefs of pearl oysters, which have been known to exist there from olden time but have never been regularly worked. A concession of an extent of some 120 miles has been granted to a Lisbon syndicate for their development.

At Lorenzo Marques, the trade exceeds that of Mozambique and all the rest of the East Coast ports. It is the supply station for Barberton and the eastern port of the South African Republic, and when the Netherlands Railway, which joins on to the Portuguese line, and the extension northwards to the Silati and Murchison range are completed, there will be a great impetus given to it. The harbour of Delagoa Bay is acknowledged to be the finest in South Africa; in its inner waters there is room for fleets of ships, and at low water there is sufficient depth to allow vessels of 4,000 tons to anchor within a few hundred yards of the town.

The town of Lorenzo Marques is situate at the mouth of the English river, which has a breadth of some 200 yards and a depth of 10 or 12 fathoms for a distance of 4 or 5 miles. About a dozen years ago it was an insignificant village consisting of a few houses, its streets unpaved, and ankle deep in sand, with surrounding swamps, and an old wall enclosing and protecting the inhabitants against native attacks. Now the wall has disappeared, the swampy ground has been drained and filled up, streets and squares laid out, houses and public buildings erected, and a Botanic Garden and private residences ornament the rising ground behind it. Wharves and warehouses are also in course of completion, and a railway extends to the neighbouring territories. The population numbers about 3,700, of whom 1,000 are Portuguese, 750 Indians, 1,500 natives, and 150 British Europeans. The surrounding country is perfectly undeveloped, although there are several rich agricultural districts, and indications of coal, diamonds, and gold, are said to be traced. The reputed unhealthiness of the climate is the great drawback to the progress of the province. In 1891, the number of deaths registered in the year was 200 to the 1,000 of the entire population; they were entered as resulting from the diseases predominating in most tropical and malarial districts. The reasons given for this unhealthiness of climate are: bad and insufficient food—mainly tinned provisions; houses inadequate to resist the sudden atmospheric changes; and the impossibility, on account of the sandy nature of the soil, of

taking any legitimate exercise. British currency is the ordinary medium of trade, but taxes and import duties are paid in Portuguese money, which in the open market is at a discount of 12 to 15 per cent.

The imports at Lorenzo Marques amounted in 1890 to £613,850; in 1891, they fell to £497,583; and in 1892, to £345,852. The principal business is importing for inland commerce, and the fact that other routes, through Natal and the Cape Colony, have lately been found more serviceable, accounts for the decrease in its trade, which it is expected will revive again on the completion of the railway now in progress, and the further development of the eastern and northern mining districts of the adjoining Republic.

Steamship communication as far as Delagoa Bay, Beira, Chinde, Quillimaine, and Mozambique, is periodically performed by the Union and Castle lines; and by the German East African line, who touch at all the ports from Natal northwards, monthly.

CHAPTER XXXI.

THE GERMAN PROTECTORATE IN NAMAQUA-
DAMARALAND.

WHEN the Cape Colony was first occupied by Great Britain, the territory on the West Coast, including Angra Pequena, Walwich Bay, and Alexander's Bay in latitude $15^{\circ} 22'$ south, was taken possession of in the king's name; and during the greater part of the present century no attempt was made to interfere with the claims of the British Government to be the paramount power there. Trading relations were maintained with it by the colonists, and by Swedish and Norwegian mercantile houses having their headquarters in Cape Town. Missions were also established by the London, Wesleyan, Rhenish, Finnish, and other Missionary Societies. No government administration, however, was set up in the country, although repeated applications were made for it, both by the missionaries and traders. The Imperial Colonial Department resisted all the pressure brought to bear upon them for annexation, on the ground that "it might incur the possibility of responsibilities which could not at the time be foreseen."

After the introduction of responsible government in the Colony, the question was again mooted. In 1874, the chiefs of the Herero tribe of Damaraland sent in petitions to the Government of the Cape, asking for British protection; and shortly afterwards the ministry of the day (Sir J. C. Molteno's) moved and carried a resolution in Parliament to extend the limits of the Colony to Walwich Bay, and such tract of country inland as might be necessary, with due regard to the rights of the natives. A Commissioner, Mr. W. C. Palgrave, who had an intimate acquaintance with the country, was then appointed to visit and confer with the Damara chiefs and people, and he reported that a universal desire existed amongst the tribes for British interference on behalf of peace and order; and they agreed to set aside a valuable tract of land for the use of the Government, from which to derive revenue for the establishment of magistrates and the administration of the law, promising payment of taxes should the amount accruing from that source prove inadequate for the purpose.

Sir Bartle Frere, who was then Governor, brought Mr. Palgrave's report under the notice of Earl Carnarvon, in a long and able despatch, urging the extension of sovereignty over the territory, which would ensure peace and order up to the Portuguese boundary, Lake Ngami, and the Transvaal, and prevent the intrusion of any foreign power. His recommendations were that, as a first step, an Order in Council should be passed empowering the Cape Parliament to legislate for the purpose of annexing the coast, and that in the meanwhile no time should be lost in hoisting the British flag at Walwich Bay. To this latter step Lord Carnarvon assented, and it was shortly afterwards carried into effect; but he did not sanction Sir Bartle Frere's larger proposals, and within a few days he quitted office. Sir Bartle Frere subsequently renewed his representations on the subject, but Her Majesty's Government continued of opinion that no action should be taken; and in 1881, when Sir Hercules Robinson was appointed to the government of the Cape Colony, specific instructions were issued to him to maintain the Orange River as the north-western limit of the Colony, and to give no countenance to the scheme for the extension of British jurisdiction over Namaqua-Damaraland.

In 1883, a Bremen merchant, Herr Luderitz, purchased from one of the Namaqua Hottentot chiefs rights of property at Angra Pequena Bay, and his Government, through the German ambassador in London, inquired of the Secretary of State whether protection would be extended to Herr Luderitz, intimating that if England exercised no jurisdiction north of the Orange River, with the exception of Walwich Bay, Germany would itself do so. The Secretary of State, Lord Derby, communicated with the Colony, enquiring whether there was any prospect of the Cape undertaking the control of Angra Pequena, and received a reply asking that the matter might be kept open as the Premier was away. Some time passed without any decision; and in the interval Prince Bismarck, acceding to the pressure of German feeling for the acquisition of new territory in Africa, adopted the old motto, "Civis Romanus sum," and proclaimed Herr Luderitz and his establishment under the protection of the Empire. The feeling in the Colony was strongly against the creation of a rival interest in a country which had always been considered as a commercial dependency of the Cape, and when Parliament met, resolutions were at once passed in favour of the annexation of the whole coast up to the Portuguese boundary. The Imperial Government, however, decided that these resolutions could not be acted upon. The formal annexation by a civilised power of territory vacant in the eye of International Law had been accomplished, and there

was nothing to be done, but to acquiesce and to welcome Germany as a neighbour.

The boundaries of the German Protectorate as agreed to between the two Governments, in 1884 and 1890, are as follows: On the south, the Orange River; on the west, the Atlantic; on the north, the Cunene River; and east, the 20th meridian of longitude up to the 22nd parallel of latitude, then a line from longitude 21° north to latitude 18°, and a strip in an easterly direction to the Chobe, and along its banks to the Zambesi River, as shown on the map.

Its area is estimated at 322,450 square miles, and its population at 117,000. Of these the tribes of Hottentots in Great Namaqualand are about 10,000. They form two divisions, the Ava-Khoin or Red Men, who claim to be the aboriginal tribes, and the Oorlams or Khoi-Khoin, who emigrated from the Cape Colony about the beginning of the century. Besides these, there are the Bastard Hottentots, originally from the Colony, forming the community of Rehoboth, to the number of 1000 persons, while scattered about the country are some 300 more. There are also the bushmen—*San*, or hunting Hottentots—the aboriginal type of the Abatwa of Central Africa, numbering about 1900. The Damara population are 26,000; they are divided into two branches, the Herero proper, and the Bandyeru, or Eastern Damaras. There is also a tribe known as the Berg or Hill-Damaras, occupying the mountain strongholds, who are distinctly of the Bantu type, but who speak a pure Namaqua tongue, and exhibit the primitive Hottentot customs and manners, as described by Kolbein. They are supposed to have been an aboriginal tribe, enslaved by the Gei-nams or Namaquas, whose language they have adopted. They are estimated to number about 16,000 souls. The tribes of Ovamboland, including the Andonga, Ongandjera, Unkuambi, and several others, are about 30,000. Besides these there are the Bushmen, and the scattered tribes of Ovamboland, Kaoko, and the north-eastern unexplored corner. The white population, including the German police force, missionaries, traders, and colonial Dutch farmers who have recently crossed the Orange River into Great Namaqualand, number over 1000.

A considerable part of the Namaqua-Damaraland territory is uninhabited, especially the coast desert tract, covered by sand dunes and drift sands. In Great Namaqualand, the drainage is all southward to the Orange River, and those who would reach the interior from Angra Pequena, have from seventy to a hundred miles to travel without pasture, and for water have to depend on one or two salt springs, until the first plateau is reached.

Further east are the deep beds of the Oub and Nosob, periodical rivers, which afterwards spread over the flats on the borders of the Kalihari, in Bechuanaland. In north Namaqualand and Damaraland, the Kuisib and Tsoaghoub (the Swakop of Galton's Travels) run westward to the sea; and the Omuramba on Matoka, another periodical river, runs north-east. Of the various salt-pans, the largest is that of Etosha, between Damaraland and Ovamboland.

Western and north-western Damaraland is essentially a cattle-breeding country, and the people have vast herds at their various cattle posts. Suitable pasture for oxen is everywhere abundant, and although the northern part is too richly grassed for sheep and goats, there are considerable tracts where the Cape sheep thrive admirably. Portions of the country have an elevation of 5,000 feet, and the average is about 3,500 feet above sea-level. Ovamboland is a comparatively low country.

Namaqua-Damaraland is tropical. During the summer months, the daily temperature ranges from 86° to 90° Fahrenheit, while on very hot days 108° has been observed. The nights again compensate for the heat of the day, the thermometer showing 60° and 50° Fahrenheit. The rainy season is from October to March and April. In South Namaqualand, especially in the Hinterland, winter rains, with occasional snow-falls, occur; and the pasturage is in many parts covered with the rich bushman grass, and abundant saline bushes like those on the southern Karroo. The climate altogether is healthy, except in the north and north-western parts of the territory, where malarial fever prevails in summer.

The rock formation of the country is somewhat similar to that of Namaqualand and the Cape Colony, viz., granite, gneiss, slates, and schists, and crystalline limestone, with the mountain elevations generally constituted of the old red sandstone. These formations are occasionally intersected by quartz reefs and a ferruginous felspathic rock known as "the copper bearer." This last formation is found from the Orange River in the Bondelzwarts territory, as far as latitude 27° towards the Kharas mountains; also in the north of Great Namaqualand, the western part of Damaraland, and the Kaoko-veld. Indications of copper abound all through the country. The Matchless mine is situated about 76 miles south-east of Otjimbingue. There the rock is chiefly micaceous schist, penetrated by a quartzose mineralised vein, carrying carbonates, silicates, and oxides of copper. This property was worked thirty years ago, until the breaking out of lung-sickness made it impossible to procure transport to Walwich Bay, and subsequent wars between the Hottentots and Damaras

interfered with the enterprise. Nearer to the coast, about 85 miles from Walwich Bay, is the Ebony Mine. But the most solid deposit of ore found is at Otave in Ovamboland, where the bushmen of old quarried and smelted the metal, using as a flux the ash of a tree met with in the country. The outcrop is about 200 feet wide and 500 feet long, and is literally honeycombed with shallow pits where the natives took out the oxide ore, until the masses of the solid sulphides baffled their rude mining tools. Here Mr. Lewis, who held a concession of the mine, sunk a shaft to 40 feet which showed splendid sulphide ore at bottom and sides. The property has now, however, been granted by the German authorities to the South-West African Company who are engaged in developing it. Some years ago, silver was reported to have been discovered on the coast a few miles south of Prince of Wales Bay. Gold has been traced in some localities, such as near the bed of the Tsoaghoub and at Otymakoko, about 46 miles from Otjimbingue, occurring in small seams of quartz generally stained with copper, but of no extent either laterally or in depth. This and other metals may yet be found in payable quantity, if the country is thoroughly explored.

In former years, a large trade in ivory and ostrich feathers was carried on by Cape mercantile houses, who had their agents and stations in Damaraland; but the elephants have been killed or driven out of the country to the swamps of the Okavanga and Chobe, and the domestication of ostriches brought the price of feathers so low that it was not worth while to hunt the wild birds, who are consequently again on the increase. The cattle trade has considerably diminished, especially in Great Namaqualand, owing to the natives being impoverished by their intertribal wars. From Namaqualand alone, at one time there used to be from 15,000 to 20,000 head of cattle sent to the Cape markets, while now barely 1500 are exported. From Damaraland, about 5000 annually find their way to the Colony. With the influx of farmers to the grazing lands north of the Orange River, the cattle and sheep trade may be reasonably expected greatly to increase within a very few years. Stock-breeding is also being taken up by many of the Namaqua and Damara traders, who have settled in the country and become possessed of farms ranging from 400 to 600 square miles in extent.

Several companies have been organised for the development of portions of the country, in which they have obtained concessions. Among these are the Suid-West Afrikanische Colonial Gesellschaft, which have taken over the Luderitz territory; the Deutsche Colonial Gesellschaft, whose sphere of working is between Okahandja, Windhoek, Rehoboth, and Gobabes; the Kharas-

khoma Exploring Syndicate, who have received mining concessions over about 30,000 square miles in South Namaqualand, and freehold grazing lands over an extent of 16,000 square miles; and the South-West African Company, an Anglo-German association, who have received a concession of 21,000 square miles of land, including the Otavi mine, and are now engaged in developing that property, and surveying routes for railway purposes from various central points to the coast.

The Cape Colony is still the possessor of Walwich Bay, and is represented there by a resident magistrate. This is the inlet and outlet for the external trade of Namaqua-Damaraland. There is a good landing-place with secure anchorage in shore. The silting up of the adjacent Sandwich Harbour, coupled with the ever-existing and well-nigh insuperable difficulties in the way of traffic between that port and the interior, enhances the importance of Walwich Bay as the only practicable port (save Angra Pequena far to the southward) on the long coast line of the territory.

CHAPTER XXXII.

SOUTH AFRICA—ITS CLIMATE AND HEALTH
RESORTS.

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CAPE TOWN.

A WELL-KNOWN writer has very pithily remarked that "three distinct Africas are known to the modern world—North Africa, where men go for health; South Africa, where they go for money; and Central Africa, where they go for adventure." The time is not far distant when the stream of health-seekers will also be directed to Southern Africa, which possesses not only an attraction in the great riches of its diamond and gold mines, but in its delightful and health-giving climate.

During the last two centuries a large portion of the most southerly part of the African Continent has been inhabited by Europeans of Dutch, French, German, and English descent; and the salubrity of the climate has been clearly demonstrated by its beneficial effect upon all who have lived here, or who have been born and bred in this country. That has been the experience not only in the oldest settled districts of the Cape Colony, but also in the Transvaal, in the Orange Free State, in Natal, and in the latest settlement of Bechuanaland; while the experience of the pioneers in the newly explored and acquired territories of Mashonaland all go to prove that the climate of Southern Africa is particularly well suited to Europeans, who can live and thrive here with added health and strength.

It is not too much to say that to-day the European born of the old stock here is as typically fine a specimen of the genus *homo* as one can find in any part of the world. A tall, well-built, strong, healthy man, with a large and numerous family of strong healthy offspring—such is the average inhabitant of European descent in this country.

Little less beneficial is the effect of the climate on those who, while born in Europe, have been residing here. Children grow more rapidly and develop sooner; while a strong sturdy manhood is followed by a happy old age, with fewer of the attendant senile diseases observed in the more rigorous climates of the north.

The prevailing idea of South Africa being a hot country, in the sense of Indian or even Australian heat, is a mistake. The greatest heat of calm summer days is not more than in the hottest parts of Europe, and lasts but for a short time. Nowhere is it excessively warm or humid, except along the coast-line from Natal eastwards; and even in the tropical zone the greater the altitude reached in going towards the high tablelands of the interior, the cooler and more bracing does it become.

The mean annual temperature for the Cape is 61·26° F., a near approach to the mean summer temperature of England, 62° F. The seasons are not so well marked as in Europe. Along the coast-line it is possible to trace the difference between spring and summer, winter and autumn; but further inland it is not so easy, as the seasons run one into the other without any marked distinction; spring becomes summer, and autumn insensibly merges into winter before the difference is perceived. The seasons also come in the reverse order to those in Europe. Christmastide with us is nearly mid-summer, with grapes and peaches and strawberries growing in rich profusion on all sides; our rich corn lands then yield their abundant harvest; and no picture can be imagined more different to the snow-covered European landscapes of this time of the year.

The following table will show more clearly the difference in seasons here, which the invalid should bear in mind in arranging his journey to this country:—

EUROPE.		SOUTH AFRICA.	
March.	}	Spring.	September.
April.			October.
May.			November.
June.	}	Summer.	December.
July.			January.
August.			February.
September.	}	Autumn.	March.
October.			April.
November.			May.
December.	}	Winter.	June.
January.			July.
February.			August.

The seasons are somewhat earlier in the western parts of the Cape Colony, where they are generally better marked, because

the winter coincides with the rainy and coldest parts of the year; while in the eastern parts of South Africa, as well as in the high tablelands of the Karroo districts, the Orange Free State and the Transvaal, the winter is cold and dry, no rain falling at this season. This is a very great advantage to the invalid who is required to escape the damp and moisture, for by travelling from one part of the country to the other he can quickly and safely escape the wet months.

To what a great extent this occurs will be made clear from the following table, taken from Dr. A. Fuller's book, 'South Africa as a Health Resort,' showing the greater rainfall in summer as compared with the winter in the eastern parts of the Cape Colony.

NAME OF TOWN.	SUMMER RAINFALL.	WINTER RAINFALL.	TOTAL INCHES.
Graaff Reinet	10 ins.	4½ ins.	14½
Colesberg	8¾ "	4½ "	13¼
Queenstown	16 "	4½ "	20½
Aliwal North	19 "	5 "	24
Grahamstown	18 "	11 "	29
Cradock	6 "	3 "	9
Mean of six towns	12.9 "	5.4 "	18.3

This increased summer rainfall, though in one respect a disadvantage, bringing as it does much moisture, is a very great boon: it cools the atmosphere, purifies the air, and makes the summer climate of the uplands more pleasant than it would be otherwise.

Spring is a most delightful season. The clear buoyant atmosphere, the blue sky, the green fields, carpeted on all sides with beautiful flowers in richest profusion, exhilarate and cheer beyond all description; the long day, with its abundant sunlight, the cool night, and the lovely cloudless sky, with its bright stars shining in myriads, all help to make a powerful impression on the mind which no time or distance can efface. This season, coinciding as it does with the European autumn, is the time of the year which is to be recommended for invalids arriving here to escape the European winter.

The summer season varies somewhat in character in different parts of South Africa. In the western portion of the Cape Colony, as has been observed, it is the dry season of the year; but in the eastern divisions and along the uplands of the Free State, Trans-

vaal, and Natal, it is the rainy season. In the highlands of the interior the prevailing winds are of local origin, and blow from the north-west for a short time, with much dust, followed by thunderstorms, with a heavy downpour of rain—sometimes a perfect deluge—which rapidly runs off or is soaked into the dry and thirsty soil; then the clouds disperse, and, as if by magic, all is changed. The atmosphere is clear and dry, the grass sprouts out, and as far as the eye can see is a vast green prairie, with low undulating hills bordering the distant horizon, the grass close-cropped and green as if in an English park. At this season, in the direct rays of the sun at Kimberley or in the Karroo, the heat may be very great, but, owing to the peculiar dryness and rarefaction of the atmosphere, it is easily bearable. Cases of sun-stroke are rare; and Europeans work out in the open in all kinds of weather without any special protection, either at the mines or in the fields.

The warm day is succeeded by a cool night, the radiation of heat being rapid on the higher levels in the Free State; and in the higher altitudes of the Cape Colony the day is cool and the air exhilarating, even in the warmest weather.

The winter everywhere is mild, no great extremes being met with, even at the higher altitudes. Snow rarely falls, and ice is met with only after a severely cold night, in thin sheets, rapidly melted by the first rays of the sun. On the coast the winter is temperate, but moist. In the Karroo and in the Free State it is simply cold and dry.

Too much attention cannot be directed to this division of Southern African climates, because it must be apparent at once that while the coast climate may be very suitable for one invalid, the climate of the interior, at an altitude of four or even six thousand feet above the sea-level, may be very harmful, and *vice versa*. Upon a proper understanding of this depends much of the happiness and comfort of many invalids, who are now sent abroad without inquiry, to the South African health resorts.

The following classification, framed on the basis of the physical contour of the country, will, I think, be useful:—

- I. The climate of the Coast: (a) of the Cape Colony; (b) of Natal.
- II. The climate of the Karroo: (a) the Great Karroo; (b) the Northern Karroo.
- III. The climate of the Interior Plateau: (a) Kalihari Desert and British Bechuanaland; (b) Free State; (c) Transvaal.
- IV. The climate of the Mountain Regions: (a) Mountain districts of the Cape, Cape Colony; (b) Mountain districts of Basutoland; (c) Uplands of Natal.

I.—THE COAST CLIMATE.

(a) *Cape Colony.*

The climate of the coast-line of the Cape varies along the western side from that on the eastern, but in general terms it can be best described as a dry marine climate. The climate of the north-western coast is very dry, especially in Namaqualand, where rain rarely falls, the only moisture being due to fogs coming from the sea. The coast, however, is dull and uninteresting, with a long, low, sandy shore extending almost the whole way from the Orange River to Cape Town. For the invalid this presents no attraction, and the few sparsely inhabited spots would offer no accommodation.

On the south-eastern and eastern side, however, the character of the coast and of the climate alter. The coast is indented by bays and inlets, and great buttresses of the eastern mountain ranges break off to dip into the sea, giving it a wild and rocky outline. The climate of this area differs very materially from that of the interior. It is very healthy, and is suitable to a large class of invalids. There is no dangerous fever-belt such as is described by travellers in tropical Africa. Indeed, fever of that type (malarial) is almost unknown, and occurs only at Kimberley in a mild form, and in certain parts of the South African Republic. But, as far as the Cape Colony is concerned, I should say that the occurrence of malarial fever is less frequent than in the Thames Valley in England.

At the south-western extremity is *Cape Town*, the capital of the Cape Colony, a considerable city, lying snugly at the base of Table Mountain. The town is situated on a lovely bay, which has been compared by travellers to the Bay of Naples, and said by competent observers to be more beautiful, lying closed in on three sides by striking and picturesque mountains, with suburbs of great beauty in its neighbourhood. "In all the world," says Mr. Froude, the historian, in his *Oceana*, "there is perhaps no city so beautifully situated as Cape Town; the grey cliffs seem to overhang it like Poseidon's precipice, which threatened the city of Alcinous; from the base a forest of pines slopes upwards wherever trees can fasten their roots, and fills the entire valley to the margin of the houses." Here the invalid who is suffering from overwork, nervous depression, or bladder or renal affections, or who is troubled with some of the milder pulmonary diseases, or, broadly, who is likely to be benefited by a stay in a dry marine climate, can find rest and comparative health either on the pine-covered slopes of Table Mountain, in Cape Town, or at Wynberg and Diep River, or Sea Point.

The mean annual temperature is 64·5° F., while the mean

summer temperature is 71·5° F.; that of spring and autumn 64·5° F.; and that of winter 57·2° F.

The winter mean of the Riviera ranges from 47° F. to 51° F., with a rainfall of 25 inches falling upon 45 to 80 days.

The rainfall for the Cape Peninsula, taking a mean of fifty years, at the Royal Observatory, was 25·46 inches.

During 1891, the absolute maximum temperature in a Stevenson's screen at the Royal Observatory, at 8 a.m., was 96·1° F. in January, with a relative humidity of 69; the absolute minimum 36·6° F. in July at noon, with a relative humidity of 67. For the year 1891, the mean relative humidity was 65·2 taken at noon, and the rainfall 30·62 inches, distributed over 79 days. At Sea Point, one of the suburbs of Cape Town, the rainfall was 19·61 inches, falling on 59 days.

This year (1891) cannot be regarded as an average one, the rainfall having been considerably larger than is usual.

Cape Town is very rapidly being improved under a progressive municipal administration. New drainage, electric lighting and wood paving will soon transform it into a model city; and modern, well-equipped, and spacious hotels for invalids and others, are now about being erected. To the traveller it is always an attractive spot. The long balmy day with abundant sunshine in summer; the winter without any very great extremes; the comparative rarity when the sun, even in winter, is obscured by clouds for more than a short time—all combine to render the climate a most enjoyable and delightful one. Invalids from warm climates, especially those suffering from malarial fevers and its attendant troubles, enlarged livers and spleens, and the poverty of the blood so often caused by it, are especially benefited by it. Before the opening of the Suez Canal, the Cape was the sanatorium of India, and it was here that the Anglo-Indian recovered his health and vigour to return to battle with the heat and plagues of the East. Dr. Stovell, writing in the *Bombay Medical Journal*, says:—"No climate in the world could be more agreeable to the feelings, and very few more beneficial for the usual class of Indian invalids, than a Cape winter. There is an invigorating freshness about this season equally delightful and beneficial; the moment the rain ceases, the clouds rapidly clear away, and the sky remains bright for several days."

For those who are convalescing from acute diseases, the plentiful sunshine and the long balmy days of our summer help soon to make rosy the anæmic tissues, and restore the broken down health.

In anæmia consequent on certain blood diseases, or as a result of scrofula or the various diseases of the lymphatic glands, I have observed most marked improvement from a residence here.

By changing the abode from Cape Town to Wynberg or Kalk Bay on the one side, or Sea Point on the other, a more bracing and tonic, or a more sedative climate can be obtained within a very small radius. During the three summer months the prevailing south-east wind, which blows sometimes with great vigour, is not beneficial to those who suffer from lung complaints; but this is not felt under the shelter of Lion's Head at Sea Point, three miles from Cape Town, or among the pine groves of Wynberg, some seven miles off, both beautiful and fashionable suburbs.

The "south-easter" is a bracing, ozone-laden wind blowing across thousands of miles of the South Atlantic, and rejoices in the title of the "Cape Doctor." Dr. Harry Leech, writing in his 'Notes on South Africa for Invalids,' says, very properly, "I can safely say that even the air of Wynberg on the one side, and of Green and Sea Point on the other side of Cape Town are very good atmospheres for invalids, and, indeed, far better than can be found at most times of the year at any so-called Sanitaria in the United Kingdom or the Continent of Europe. And there is this very great advantage in choosing South Africa as a climatic prescription. Even for the invalid who does not care, or is not able to go beyond the precincts of Cape Town, a residence in the Wynberg district during the summer months (Cape summer), and at Sea Point during the winter months, will avoid the disagreeable circumstances that obtain on both sides of the capital at certain seasons of the year."

Further along the coast are situated Mossel Bay, Knysna, Port Elizabeth, East London, and in Natal, Durban—ports all visited by large ocean steamers starting from Cape Town on the way to Natal. They all present much the same climates, and are not to be highly recommended for the sufferer from chest complaints; but to the voyager for rest or change they are suitable for a visit.

(b) *The Coast of Natal.*

The climate of the coast lands of Natal is warm and enervating and, except during the winter months, should be avoided by the invalid. During the winter months, however, a most enjoyable journey may be made in this very beautiful country. Durban, the port, is beautifully situated, with a tropical richness of foliage, and surrounded by hills covered with the greenest verdure. The hotels have the reputation of being the best in South Africa.

The highest temperature during 1875 was 99° F., the lowest 45° F. The mean daily range was 17·05; the approximate mean

Ceres was first brought to notice as a health resort by the late Dr. Harry Leach, medical officer of the Port of London, in 1878, and since then it has enjoyed a deservedly high repute. He says: "A very pleasant and probably beneficial change may be made by travelling up to Ceres, a pretty village about seven hours from Cape Town. Most of the journey can be made by rail, and the rest by cart, through 'Mitchell's Pass,' one of the most picturesque places in the Colony."

At Ceres ample and very satisfactory accommodation has been provided at the Belmont Sanatorium and the Ceres Sanatorium, and all the requirements of the most fastidious European invalids can now be met.

Besides the advantage of first-rate medical attendance can be easily obtained. Both Dr. Zahn, the district surgeon, a gentleman well qualified to speak by reason of a lengthened residence here, and Dr. Harford report strongly in favour of this climate for invalids. Most cases of lung disease and convalescence from acute diseases do well here; especially is the season from September to May to be recommended.

In several patients of my own marked benefit has followed; in one case of chronic phthisis of some years' duration, the patient by spending part of the year at Ceres is enabled to gain sufficient strength and health to carry on an extensive business in Cape Town. The cold of winter and the increased humidity of the atmosphere, on the other hand, are not at all favourable in their conditions.

The mean maximum temperature of Ceres during 1891 was 73·5; the minimum, 45·9. The total annual rainfall was 31·24 inches in 71 days. The relative humidity for the year 83·8, while the humidity in January was 65·0.

Going on from Ceres Road Station, the ascent from the coast followed by the main line of railway to Kimberley is very gradual, and, after leaving the pleasantly situated and thriving town of Worcester (780 feet), enters the Hex River Pass, a stupendous work of engineering skill, and of singularly wild and romantic beauty, to reach the summit—*Touw's River* (2500 feet). This is a railway camp, where the air is cool and bracing, with mountainous surroundings. No accommodation exists, unfortunately, for the invalids; but very satisfactory results have been obtained here among the railway employés, who are sent to recruit after severe illness, or who are suffering from lung disease.

Leaving *Touw's River*, Matjesfontein is reached in about two hours by rail, and 194 miles from Cape Town. Lying at an altitude of 2970 feet, it is a stopping place for refreshments for passengers proceeding by the ordinary trains, and is provided with

good accommodation, first-class table at the hotel, &c. The invalid who is journeying north is advised to break his journey here for a time, to recover strength and to accustom himself to the higher altitude and increased rarefaction of the atmosphere.

The total annual rainfall (1891) was 5·41 inches, falling on 22 days—a *wet* year too! Matjesfontein is resorted to now by a large number of invalids, and the results obtained in many instances are uniformly good. Cases of consolidation of the lung after pneumonia or pleurisy, asthma, chronic bronchitis, inveterate cough are all benefited, and many sufferers from phthisis derive much benefit from a stay here. It is cool in summer, and invalids find no difficulty in taking long walks even in the middle of the day. The climate is bracing, and the effect of the bright atmosphere is most exhilarating. The coming and going of the through trains to Kimberley and Johannesburg and to Cape Town supply a constant source of interest, not easily obtained elsewhere in the Karroo.

From Matjesfontein the line passes through the village of Beaufort West, which enjoys a considerable repute as a very good health resort, with fairly good accommodation in the hotels and boarding-houses of the village. It is 339 miles from Cape Town, and lies at an altitude of 2792 feet above the sea level. The village is well laid out, with broad streets planted with rows of trees, and is visited by a considerable number of invalids. In the neighbourhood, at the base of the Nieuweveld Mountains, some 20 minutes by cart from the village, a sanatorium has recently been opened, called "Lemoenfontein." It lies 400 feet higher than Beaufort itself, and has a charming site. Here every arrangement has been made to suit the comfort and convenience of visitors. This will supply a very great want in the Karroo, as, up to this, no large enough establishment has been started to give residents those comforts and conveniences which can only be obtained when a large number of persons live together. At Beaufort West the average rainfall during 1891 was 9·44 inches, which fell on 41 days. On some of the farms in the neighbourhood, in the Nieuweveld Mountains, invalids are received as boarders.

At Wagenaar's Kraal, which is four hours' drive by post-cart from Nelspoort Station, a couple of English families receive resident invalids. The results I have observed in patients of my own lead me strongly to recommend this locality. The altitude has not been determined, but is assumed to be about 3500 feet above sea level. The annual rainfall (1891) was 14·35 inches, falling on 38 days; the mean annual humidity 64·0. The following observations, taken at 8 a.m. during 1891, show the mean

maximum temperature for the three warmest summer months was 82°F . The mean minimum temperature for the three coldest months was 35.4°F ., while the greatest actual cold was registered in August and September at 25°F . At this place, moreover, there is a resident physician, specially qualified to deal with all conditions to which this climate is most suited.

Graaff Reinet, with an altitude of 2500 feet above sea-level, is the terminus of a line of railway from Port Elizabeth, at a distance of 185 miles. It enjoys a considerable repute as a health resort, but it is hot in summer. In winter, however, it is well suited to cases of phthisis. Under any circumstances, a residence in the neighbouring hills is to be preferred to the town.

Cradock, lying near Graaff Reinet on a line of railway from Port Elizabeth about 181 miles, at an altitude of 2850 feet, has a good climate well suited to pulmonary complaints. It has an annual rainfall of 26.81 inches falling in 69 days.

Tarkastad, five hours by cart from Cradock, with an elevation of 4280 feet, has an exceedingly good climate which is much to be commended. It is not shut in by hills, and is cooler than some of the other Karroo resorts. There is, moreover, good accommodation here, with capable physicians of good repute at hand.

(b) *The Northern Karroo.*

The Northern Karroo lies at a considerably higher elevation than the Great Karroo, from which it is separated by the Nieuweveld and Sneeuwberg Mountains. It includes the whole of the northern divisions of the Cape Colony, and extends from Namaqualand on the west to the Stormbergen in the east. It varies in height from about 2700 to 6000 feet above the sea-level, while the mountain ranges run to a considerably higher altitude, Compass Berg being 7800 feet high.

The marked feature of this area is its very considerable altitude, which may be said to average about 4000 feet above the sea level. At an altitude so considerable as this, with an exceedingly dry climate, it is to be expected that pulmonary complaints should be rare, and an almost unanimous opinion has been expressed by those practitioners who live in this locality that phthisis among the inhabitants born and bred here is almost unknown. At what altitude an immunity to phthisis occurs has yet to be established; but it is certain, so far as experience goes, that here in South Africa we have conditions which are widely different from those occurring elsewhere. The peculiar dryness and rarefaction of the atmosphere in the Karroo, with the more constant sunlight, rich in actinic properties, and the absence of great

changes, give the climate at an altitude considerably lower than elsewhere the same effect obtained in Europe only at the highest altitudes.

In the western portion of this district we have Frazerburg, ten miles from the nearest railway station, and 360 miles from Cape Town, with an altitude of 4500 feet above sea level. The winter is cold, with considerable frost; the summer is warm, with cool evenings. For certain cases of phthisis, with much secretion, in comparatively robust persons, who have considerable resources to while away the tedious monotony of living in this district, this place may be recommended. Further towards the east lie Victoria West, Richmond, Hanover, Middelburg, Colesberg, Burghersdorp, and Aliwal North, all enjoying climates which are much extolled. Victoria West, 4100 feet above sea line, with an annual rainfall of 12·42 inches. Richmond, 4700 feet altitude; an annual rainfall of 17·50 inches; mean for 13 years, 12·88 inches. Hanover, 4500 feet high; rainfall, 25·75 inches. Colesberg, 4400 feet; rainfall, 27·40 inches; mean for 14 years, 15·56 inches. Burghersdorp, 4500 feet high; rainfall, 33·04 inches. Aliwal North, 4,330 feet high; rainfall, 38·79 inches; mean for 25 years, 25·19 inches. Colesberg, on a branch line, is in communication by rail with Cape Town, Port Elizabeth, and East London, from each of which it is easily accessible.

Aliwal North, on the East London Railway line, is in railway communication with Cape Town and Port Elizabeth as well. It is situated on the banks of the Orange River at an altitude of 4330 feet, and has gained considerable reputation as a health resort. Dr. Symes Thompson, consulting physician to the Brompton Hospital for Consumption, London, says that "Aliwal is beyond doubt one of the most valuable health resorts of South Africa for phthisical patients." The annual rainfall, however (38·79 inches in 1891), and the relative humidity (74·5 per cent.) is considerably higher than Bloemfontein, for example, and much higher than Richmond, which has an altitude of 4500 feet, giving 17·50 inches of rainfall for the same year. There is good shooting in the neighbourhood, and fishing in the river. The accommodation is fair, and there is a well-trained English medical man with special qualification to treat cases of lung disease, and who offers accommodation in his own family for one or two invalids. The air of Aliwal is cool and bracing. Burghersdorp, situated near Aliwal North, on the same line of railway nearer to the coast ports, at an altitude of 4552 feet, has been warmly recommended by Dr. Kannemeyer, the district surgeon, who says: "The sun is rarely obscured, never for a whole day, mostly and gratefully by thunder clouds during the hot summer afternoons. We live practically

under a cloudless sky. Our principal rainfall is in summer—sharp and short thunderstorms.

North of the Orange River are Kimberley and Barkly West. Kimberley, 647 miles by rail from Cape Town, possesses a climate which, while well suited to invalids suffering from pulmonary affections, has yet disadvantages which make it impossible to recommend it generally. The occurrence of a form of malarial fever of a mild type, and the general prevalence of dust, together with the heat of summer, make it by no means a suitable climate for invalids. Certain cases of slight pulmonary disease, in otherwise robust individuals, who wish to obtain work, may be permitted to reside there. The altitude is 4042 feet, and the annual rainfall (1891) 34·23 inches, with a relative humidity of 63·2.

A short distance from Kimberley is Barkly West, on the Orange River, where a hospital and sanatorium has been erected for invalids, with an altitude of 3800 feet. This has been strongly recommended by the late District Surgeon, Dr. Harrhy, who has reported very remarkable results obtained here in the treatment of pulmonary complaints.

III.—CLIMATE OF THE INTERIOR PLATEAU.

The interior tableland of Central South Africa extends from the Orange River northwards. The whole of this area is practically one vast undulating plain, with here and there low hills or mountains. In Bechuanaland, in the Kalahari Desert, and in the so-called Bush Veld of the Transvaal there are extensive forests of trees, but they are the exceptions; and one may travel for days through the Free State and the Transvaal without seeing any trees or bushes except along the river banks, where a few stunted mimosas are to be met with.

(a) *Bechuanaland.*

Dr. Livingstone, the great African traveller, who spent many years in this district, considered Bechuanaland as admirably suited for all patients having pulmonary complaints. "It is the complete antipodes of our cold, damp English winter. The winter is perfectly dry, and as not a drop of rain even falls from the end of May to the beginning of August, damp and cold are never combined. However hot the day may have been at Kolobeng (and the thermometer, previous to rain, sometimes rose to 96° F. in the shade), yet the atmosphere never had that straining and debilitating effect so well known in India, and in parts of the coast region of South Africa itself. You may sleep out of doors

with the most perfect impunity, as for many months not a drop of dew falls."

Vryburg, the capital of British Bechuanaland, at an elevation of 4,300 feet, and 744 miles from Cape Town, has been in existence too short a time to offer good accommodation for any but the robust invalids who are willing to rough it.

The country on the border of the Kalahari is teeming with game, and for men with weak lungs who can go upon short or even long hunting expeditions, making Vryburg their centre, this district has much to recommend it. I have seen remarkably good results in the case of at least one patient who spent a year travelling and shooting in this district; and I think his example may be imitated by others with benefit.

(b) *The Free State.*

The Orange Free State forms a portion of the great central plateau of South Africa, stretching from the Maluti and Drakensberg range of mountains on its eastern side, to the Vaal and Orange rivers, through vast plains from 4000 feet to a general level of about 5000 feet.

This plateau has a considerably higher elevation than that of the Karroo, as shewn by the altitudes of some of its principal towns.

Bloemfontein	.	.	4518 feet above sea level.			
Kroonstad	.	.	4500	"	"	"
Ladybrand	.	.	5000	"	"	"
Phillipolis	.	.	4700	"	"	"
Harrismith	.	.	5000	"	"	"
Smithfield	.	.	4400	"	"	"

When it is remembered that the elevation of Wiesen in the Alps is 4757 feet, and of Davos Platz in the same valley 5124 feet, it will be seen that here we have an elevation which approximates very closely, and in places exceeds that of the most famous of the Alpine health resorts in Europe.

The climate of the whole of this area is most delightful, being cool and bracing, with a bright superabundant almost dazzling sunlight. The days in summer during the morning and evening are cool, but in the middle of the day the heat is considerable, while the nights are cool and refreshing. During the winter the air is balmy and warm in the sun, but the nights are intensely cold, the temperature rapidly falling to some degrees below freezing-point.

This climate, in other words, is much akin to that of the Karroo, though the average amount of rainfall is greater and is more evenly distributed; the greatest rainfall takes place in summer,

while the winter is the dry season. The short stunted Karroo bushes which occur in the lower terraces have disappeared here, and the whole country is covered with abundant grass, but without any bush or trees. The soil rapidly absorbs the water, and a few minutes after rain the ground is dry.

The winds are of local origin, and blow, as in the Karroo, from the north and north-west; they rise suddenly and pass away rapidly. They are, however, disagreeable, as they stir up a good deal of dust; but in other ways they are not injurious, and are not frequent.

Dr. A. Fuller, of Kimberley, writing about the climate of this portion of South Africa, says: "We find that during the six hottest months of the year the average maximum temperature is 82° F., the average minimum for the same period 55° F., and the highest for one month being 60°; the humidity during these months registered 55 per cent. on an average. The heat of summer, therefore, is considerable, but perfectly tolerable with the dry atmosphere; the nights are deliciously balmy, and enable the invalid to sleep with doors and windows open during the night, or even to sleep altogether in the open air. This is of the greatest advantage to the invalid, who, above all things, requires as much pure air as he can get. The dryness of the atmosphere—humidity 55 per cent.—contributes largely to this procedure."

This State, under wise and judicious government, has made great strides, and offers many inducements to those who, though crippled in health, have yet energy or money to develop fresh undertakings. For a limited number of professional men there is always some opening, and in this beautiful and healthy climate many not able to live elsewhere will find ample room and scope. I know several instances of such men who have made this State their home, with the most beneficial results. To invalids who are not strong enough, who require careful nursing and treatment, and whose cases are otherwise suitable, the various towns offer accommodation and skilful attendants well suited to all such cases. For example, Bloemfontein, the capital, a town of some 5000 inhabitants, has risen into very great reputation in the treatment of pulmonary complaints, and presents many advantages. Good accommodation and several good practical practitioners, who have devoted great attention to pulmonary complaints, and who have carefully studied the effect of the climate of this Free State upon such cases.

It is still much to be deplored that no first-class sanatorium exists in this plateau, with an attempt to treat phthisis in the regular and systematic manner that has been attempted in the

Alpine resorts in Europe. The main trunk line to Johannesburg and Pretoria running now through the Free State, every part of it is easily accessible from the coast.

Taking the Meteorological Commissioners' Report published by the Cape Government for the year 1891 as a sample—though this is by no means an average year, as much more rain fell than is usual—the following observations taken at Bloemfontein show the mean barometric pressure for the year was 25·545; the lowest mean occurring in December, 25·433; the highest mean in July, 25·709. The total annual rainfall for the year was 34·57 inches, falling on 70 days, and the mean annual amount of cloud 3·9. The rainfall for 1886 was 17·47 inches, which would be nearer the usual average. At 9 a.m. the mean relative humidity for the year was 63·4, being highest in April, 77·0, and lowest in September, 49·0. At the same hour the mean annual maximum temperature was 77·5, the mean minimum 46·8. Comparing these figures with Davos-Platz, the most noted of the Alpine resorts for consumption, we find: "The amount of rain was in 1867, according to Spengler, 37·43 inches; in 1876, according to Steffen, 41·41 inches. Rain or snow fell in 1876 on 159 days, the number of clear days being 112." Again: "The mean relative humidity was in 1876 75·2, ranging from 80·4 at 7 a.m. to 5·76 at 1 p.m. . . . and being on the average somewhat higher in winter than summer."*

The climate of Bloemfontein, therefore, with nearly the same altitude as Davos-Platz has many advantages in a certain class of cases, especially where great and continuous cold is contra-indicated. The climate is shortly that of a warm, dry Alpine climate, with an excess of sunlight and a minimum of cloud.

During a year which was particularly rainy (1891) the total rainfall took place on 70 days, as compared with 159 at Davos-Platz, and on very few of these days would it be impossible for the invalid to get out and take his usual exercise. What has been said of the Bloemfontein climate applies broadly to the whole of this plateau.

Dr. Clarke, of Bloemfontein, in an interesting paper on "Bloemfontein as a Health Resort in Cases of Diseases of the Lungs," read during the last year to the Cape of Good Hope Branch of the British Medical Association, says: "It has long appeared to me that the cases which do best at Davos, at an elevation of 5,124 feet, are the cases which are most suitable for Bloemfontein, at an elevation of 4,500 feet." While Dr. Stollreither, a well-known practitioner of Bloemfontein, writes: "In spite of the insufficient

* Hermann Weber, 'Treatment of Disease by Climate.'

accommodation, however, the results of the climatic cure are not only good, but often surprising. Suffice it to say that I have seen many a perfect cure of asthma, laryngeal and bronchial catarrh; consumption of the lungs I have seen greatly improved and even cured. The climate is invigorating and strengthening . . ."

Further, writing with reference to the suitability of the climate of Bloemfontein to consumptives, Dr. Clarke, in his interesting paper before alluded to, says: "I have been accustomed to consider the summer months as most stimulating, and the winter months as most bracing. The irritability and restlessness in those of excitable temperament, which further in my paper I have alluded to, almost always occurs in the summer months. Another point which a patient coming here should be warned of is that for the first few days of his stay he will find many of his symptoms alarmingly increased. The nights are often restless, the appetite bad, and the breathing very much shorter. These increased symptoms seldom remain after the first week, but I find it a source of great relief to new arrivals to learn that they are of common occurrence." Dr. Clarke particularly recommends the climate of Bloemfontein in cases where the disease is not far advanced, and where there are no complications, combined with a cheerful but not excitable temperament; cases of ill-formed chest, with feeble action of lungs, in persons descended from phthisical or scrofulous parents; in flattening or consolidation after pleurisy or pneumonia. On the other hand, cases of chronic phthisis with a cavity, and where a considerable hæmorrhage has already taken place, are unsuitable, as well as acute phthisis with lung tissue rapidly breaking down, and attendant high evening temperatures and indigestion.

When writing of a district, the whole of which is exceptionally good for a certain class of pulmonary diseases, it is difficult to select one more especially than another. For example, Boshof, a pleasant little village 30 miles or five hours by road from Kimberley, is very highly commended by Dr. Arnold Watkins, a practitioner of well known standing, at one time resident there, who says: "I have from time to time seen patients suffering from phthisis which had developed in Europe or some of the coast towns, and many of them have marvellously improved in health during a residence in the Free State." And again, Harrismith, with its great altitude, must rise into repute as a resort for invalids suffering from phthisis. It does not possess, however, the other advantages and social life which Bloemfontein does. It has, however, a climate which can be warmly recommended.

In the neighbourhood of Bloemfontein and in other parts the

farms are sometimes provided with accommodation for one or two invalids; information on this point can generally be obtained at Bloemfontein.

(c) *The Transvaal.*

Beyond the Vaal River, to the North of the Orange River Free State, and extending to the Limpopo River, lies this considerable state, *the South African Republic*, which has attracted such great attention on account of the discovery of its vast and rich gold deposits.

The elevation of this plateau is very considerable, as will be seen from the following table:—

Potchefstroom	.	.	3900 feet above sea level.		
Heidelberg	.	.	5000	"	"
Wakkerstroom	.	.	6000	"	"
Utrecht	.	.	3528	"	"
Standerton	.	.	5200	"	"
Pretoria	.	.	4450	"	"
Johannesburg	.	.	5600	"	"

It must be said that probably these elevations are below the mark, the general elevation of this plateau being from about 5000 to 7000 feet.

Although lying in the semi-tropical zone, the climate of the Transvaal is cool and bracing. When it is remembered that it is estimated for every 300 feet of altitude the thermometer falls one degree, it can be readily seen that the greater altitude of the Transvaal ensures for it a cooler climate than the coast districts. "The winter season, from April to September, is cold and dry, particularly during the nights; the days are often as warm as in summer. The rains commence in September, but as a rule the heavy rains do not set in before December and end in March. . . . Thunderstorms are very frequent and violent during the summer months; hailstorms are also frequent and often destroy vegetation and crops within a few minutes; while during the winter months cutting, sharp, cold winds blow from the south, and the High Veldt and Drakenberg Mountains are frequently covered with snow" (F. Jeppe).

The mean annual temperature is 68·64, being an average of three years.

Owing to the absence of published official statistics of the meteorology of the Transvaal, it is impossible to give very reliable information as to the climatology of this interesting country. It will not be long, however, before this gap will be

filled up, as accurate observations are being taken in different localities.

Through the courtesy of Mr. W. H. Miles, C.E., I have been permitted to make use of his exceedingly valuable observations on the meteorology of Johannesburg.

The total rainfall for 1889 was 19·85 inches, falling on 59 days; 1890 was 25·94 inches, falling on 69 days; 1891 was 40·85 inches, falling on 99 days; 1892 was 27·54 inches, falling on 94 days. During 1889 absolutely no rain fell for five months, from May to September, which is the usual rainless season, 0·75 inches only having fallen during this period in 1890. The rainy season generally sets in in November and continues to April; severe thunderstorms followed by a heavy fall of rain. During 1892 the highest barometric pressure was 25·56 for July, the lowest 25·02 occurring in December. The mean temperature for the three summer months of December, January and February was 72·91° F., while for the winter months, June, July and August, 52·74° F. In 1892 the averages are slightly higher.

During the winter months great and sudden changes are experienced—for example, in May, 1892, on two days the temperature in the sun fell from 111° F. to 30° F.; in June on 19 days from over 100° F. to under 40° F., and on 14 days from over 100° F. to freezing point; in July on 18 days from over 100° F. to freezing point. In August on 12 days from over 100° to under 40, and in 5 days from over 100° to freezing.

Johannesburg, the centre of the Witwatersrand gold fields, has grown with phenomenal rapidity in a couple of years into a large and fine city. Lying at such a great altitude, with a cool dry bracing atmosphere, it has a most beneficial effect in certain cases of pulmonary diseases. But the town is dust-laden, and the sanitary arrangements as yet are very imperfect. In the winter the great and sudden changes should be guarded against. In summer the climate is most exhilarating and stimulating (without having the effect of prejudicially affecting the nervous temperament, so often noticed in the Karroo at a lower altitude), due doubtless to the cool and bracing atmosphere. In several patients who suffered from asthma on the coast this disappeared rapidly at Johannesburg.

Pretoria, the capital of the South African Republic, is some 35 miles north of Johannesburg, with which it is connected by rail. It is not to be highly recommended for invalids, who do badly here as a rule. The town is shut in by hills, and is exposed to sudden changes, which are very trying to weak persons. Taking the figures published by Mr. J. R. Lys, of Pretoria, as the only accessible ones, we find that the total rainfall was for the following

years:—1877, 21·45 inches; 1878, 26·63 inches; 1879, 30·74 inches.

The mean annual temperature (3 years) was 68·64° F., while the mean monthly maximum temperature for the three summer months was, in 1877:—December, 89° F.; January, 92° F.; February, 86° F. The mean monthly minimum temperatures being recorded in June, 43° F.; July, 42° F.; August, 40° F. during the same year.

Heidelberg is a charming village, very pleasantly situated, well laid out, with good accommodation, and easily reached from Johannesburg by coach. It has a considerable elevation, and is likely to become a favoured resort for invalids.

Standerton, too, has a very favourable climate, though the accommodation there is not to be commended.

At Wakkerstroom, near the Natal border, the altitude (6000 feet) is a most suitable one, but no good accommodation has yet been provided for the invalids. The establishment of a sanatorium here is much to be desired. The climate is exhilarating and bracing, and most beneficial in pulmonary cases.

Potchefstroom has a most beautiful site on the "Mooi Rivier," and has a climate which has many advantages.

While the southern grass-covered plains of the Transvaal are particularly healthy, in the north, along the Zoutpansberg, and in the valleys of what is known as the "low country," a malarial fever occurs, especially during the rainy season, which is severe, and will prevent this part of the country from being attractive to the invalid. As far as the southern parts of the Transvaal are concerned, however, they are much to be commended for phthisis and other pulmonary diseases.

IV.—CLIMATE OF THE MOUNTAIN REGIONS.

The great tablelands of South Africa are separated from each other by two parallel ranges of mountains, which start in the west and continue through the eastern divisions of the Cape Colony to join in the Stormbergen and run on to become the Drakensberg range, which divides Natal from the Transvaal. There is not, anywhere in the whole of South Africa a single peak which rises above the limit of perpetual snow. In this region, however, there are many localities with very desirable climates for invalids, and, when employed as an adjunct to the Karroo resorts, of the greatest benefit in cases of consumption especially.

While the altitude of the Karroo is such as to enable it to be classified as a mountain climate, the dryness and absence of cloud give to it those peculiar features which are not so much the characteristics of a mountain climate, in which, together with

altitude, we have a greater amount of moisture, more frequent variation in temperature, together with more intense cold in winter and the occurrence of cloud. This marked difference is no less important from a climatic than from a therapeutic point of view, for while the climate of the plain may be relaxing or even enervating, especially during the summer months, that of the mountains near by is tonic and stimulating.

(a) *The Mountain Districts of the Cape Colony.*

In the neighbourhood of the village of Ceres, for example, the Cold Bokkeveld has an Alpine climate with hardly enough warmth in summer to ripen cherries, and so cold in winter as to force the farmers to descend with their flocks to the lower and warmer levels of the Karroo to escape the snow which lies on the ground here for weeks at a time. The climate of this locality is most bracing and stimulating. No accommodation, however, exists, except that which the farmers are able to provide.

Not far from Beaufort West is a flat-topped range of mountains called the *Nieuweveld Mountains*, where several farmers provide accommodation for invalids; while in the *Zuurberg* (3192 feet), not far from Port Elizabeth, hotels have been built and accommodation provided for invalids, who find the air stimulating and exhilarating. The Zuurberg mountains are covered by dense bush, with grand mountain scenery well worthy of a visit. The railway to Grahamstown passes near this range.

Grahamstown, lying 42 miles from the coast, is easily reached by rail from Port Elizabeth or Port Alfred. It has an elevation of 1854 feet above the sea level, is sheltered by hills, charmingly situated in a romantic neighbourhood, and is a pleasant English-like town with beautiful gardens and walks.

The Hon. Dr. G. W. Atherstone writes very warmly of the advantages of this climate: "During my professional life of 45 years in Grahamstown I have known cases of consumption far advanced completely recover, and even phthisical cavities have cicatrised and the progress of the disease has been entirely checked when confined to one lung."

The town has many advantages for a large class of invalids, and especially for those anxious to reside there; there are good schools, English society and pleasant surroundings.

Near to Graaff Reinet, in the Oudeberg Mountain, is situated a mountain health resort which is well spoken of. An hotel has been built here, and suitable accommodation has been provided for invalids. It is reached by cart from Graaff Reinet in two hours. Lying at an altitude of about 3930 feet above the sea, it is nearly 1500 feet higher than Graaff Reinet itself. It has a

cool and invigorating climate, very refreshing after the warmth of the plains. The highest point at the summit of the mountain is 5680 feet above sea level.

Not far from Grahamstown is King Williamstown, at an altitude of 1314 feet, and with a climate similar to that of Grahamstown.

At the foot of the Stormberg Mountains, Queenstown is situated at an elevation of 3500 feet above the level of the sea; it is 154 miles from East London, which is reached in about nine hours by rail. The mean temperature of the four hottest months is 69° F., and of the four coldest 52° F. The annual rainfall (mean for 20 years) is 22·71 inches, the rainfall during 1891 being 43·16 inches. The mean humidity during the same period was 70·9. The climate of Queenstown is well adapted to the treatment of cases of consumption which require, together with altitude, a dry, equable climate. The summers are cool, but the winter is cold, snow being not infrequent, and lying on the ground for days sometimes before it is melted away.

Lying between Grahamstown and Queenstown is the far-famed Katberg Pass, in the Katberg Mountains. The elevation of the Lower Katberg is 3380 feet, while that of the higher is 4990 above the sea level. The whole of this is a most wild and beautiful neighbourhood; ridge after ridge of mountains tumbled about in wild confusion, tree-clad from base to summit, presenting a variety of scenery not commonly met with. The tourist will find much to enjoy in a visit to this beautiful locality. Good accommodation is obtainable, and it is best reached by cart from Fort Beaufort. The climate is cool and bracing, even in summer, while in winter it is cold.

Not far from Queenstown, and lying at the opposite side of the same range of mountains—the Stormbergen—are the villages of Sterkstroom, 4405 feet, and Dordrecht, with 5500 feet above the sea level. The climate of these places is dry and cool in summer and intensely cold in winter. The whole of these districts are inhabited by English farmers of the best class, and on several farms very suitable accommodation is obtainable for invalids.

Further to the north-east, not far from the Basuto border, is Barkly East, 5831 feet above the sea level, with a mountain climate, cool throughout even the warmest summer.

(b) *Mountain Districts of Basutoland.*

Beyond the border, in the native territories of Basutoland and East Griqualand, there is a most delightful mountain climate, exhilarating in summer and intensely cold in winter. Dr. H. S. Taylor, of Ficksburg, a practitioner of repute and

experience, writing of the climate of Basutoland, says: "The climate of Basutoland is one of the finest. The air is dry and bracing, the nights even in the height of summer always cool. The days in summer are warm, though the heat can seldom be called excessive. The winter months, June, July and August, are cold (intensely so at night) and dry, rain very seldom falling from May to October; the air bright, sunny and bracing. Frequent showers fall during October, November and December. The months of January and February are the rainy ones, and the rainfall is then abundant. Frost is generally met with towards the end of April; May is a delightful month, and June is the commencement of winter.' As a sanatorium, especially for phthisical complaints, Basutoland would be unrivalled, particularly in selected portions; but the time has hardly come for its being used as such, except in isolated cases. The difficulty of access, the half settled state of the country, the scarcity of luxuries and sometimes the necessities of life, the want of accommodation for invalids, and the uncertainty of the future fate of Basutoland, are all stumbling blocks that must be removed before organised sanatoria can flourish in the country."

(c) *The Natal Uplands.*

The climate of the Natal Highlands may be most accurately included under the heading of mountain climates, for not only is the elevation considerable, but the country is very irregular and mountainous. Starting from the coast, we find that the land rises rapidly by a series of terraces.

"The first terrace, 1730 feet high, rises above the village of Pinetown, 12 miles inland; the second, 2,432 feet high, is at Botha's Hill; the third, 3700 feet high, begins on the Town Hill above Maritzburg, 45 miles from the sea; and the fourth, 5000 feet high, forms the highlands between the villages of Weston and Estcourt. From this point the surface rises and falls with little variation till the Pass is reached, which crosses the Berg at an elevation of 5600 feet, and at a distance of 225 miles from Durban by rail. The Berg itself is the rugged cliff-edge of the crowning terrace, the vast central plateau of South Africa."—*Russel's 'Natal.'*

The climate in the lower of these terraces is dry and cool, while at the higher elevations it is cold and bracing. There can be said to be only two seasons: the winter begins in the month of April and continues until the end of September, the summer starts in the month of October to end in March.

During the winter months, the temperature at night falls to 45°

or even 40° , and the air is laden with moisture. The sky is generally filled with haze in the early morning, and the air is fresh and cold. Between 8 and 9 the sun breaks through the mist, and the temperature rises rapidly to 66° or 70° ; the sunshine continues all day. "During the six winter months of the year 1858," says Dr. Mann, to whose book on the 'Colony of Natal' I am indebted for much valuable information, "there were only 24 days of unbroken cloud, and there were 83 days of uninterrupted sunshine." The average highest temperature for the three coldest months was 69.3° , and the average coldest temperature of the night for the same months was 47.7° . The mean for the six winter months was 60.7° at Maritzburg.

The prevailing wind is south-east. The rainfall during this season (six months) amounted to 4.8 inches.

The winter is the dry season, the rainy season setting in with the summer months in October. In the six summer months of 1858 and 1859 there were 80 days in which rain fell in the neighbourhood of Maritzburg, making a total of rainfall during this period of $21\frac{8}{100}$ inches. The rain falls usually in the afternoon during the occurrence of a thunderstorm, which are very prevalent here. During the six summer months, 1858 and 1859, thunder was heard or lightning was seen near Maritzburg on 72 days.

The mean temperature for the six summer months near Maritzburg was 69.4° , the highest reading being 93.4° ; the lowest, at night, 50.5° F.

The prevailing winds in the summer are from the south-east, and every now and again a hot, scorching, dry wind blows from the north-west. This usually begins in August, and rarely blows in winter. It is very trying. The highest reading in this hot wind was 96.8° , with a humidity of 26° or 42° , as tested by the hygrometer. Fortunately, they last only a short time—6 or 18 hours—and do not occur often.

Within this area are several health resorts, for consumptive invalids especially, of very great local repute. They are, in order of their altitude and distance from the coast:—

Pietermaritzburg, the capital, easily reached from Durban, the port, by rail, from which it is distanced 60 miles. It has an elevation of 2210 feet. The accommodation for invalids here is good, and the climate during the winter months is favourable, though the summer temperature is higher, and the air is less dry than in the more elevated resorts. The annual rainfall is about 38 inches, falling on 117 days.

Not far from Pietermaritzburg is Howick, on the line of railway, with an elevation of 3700 feet above sea level. It enjoys a

very good reputation as a resort for invalids and further along the line are Estcourt (3900 feet) and Colenso (3435 feet), both small villages, with climates highly spoken of by invalids.

Further along the same line of rail, which runs from the port of Durban to the extreme limit of the Natal border, where it touches the Transvaal, are the towns of Ladysmith (3284 feet high), Newcastle (3893 feet high), and on a branch line Dundee (4104 feet high). Of these towns Newcastle has been especially well spoken of as a health resort, but one can say that they are all good.

Lying on the Natal border is a new township, Charlestown, which owes its existence to the fact of its being the terminus of the Natal line of railways. It lies at an altitude of 5386 feet, in a mountainous district, overtopped by the historic Majuba mountain, and near the no less famous mountain pass of Laing's Nek. The surrounding scenery is grand, and this place well deserves a visit. No data exist as yet, unfortunately, with reference to the climate of this place. The air is pure and bright, and the atmosphere is cool and bracing, being exhilarating. To invalids who require a dry warm mountain air, Charlestown can offer many advantages.

The great elevation ensures for it a cool climate during the warmest summer months, while at the same time the proximity of the mountains, rising to 7000 feet at Majuba, shelters it from the winds and gives the landscape a charm and variety.

The climate of Natal is the boast of the Natal colonist. It may be said to be semi-tropical in the lower terraces and temperate in the higher. While along the lower terraces the vegetation is tropical, in the higher terraces the country is mostly covered with grass. The climate of these upland districts is of great benefit in almost all pulmonary diseases. In incipient phthisis and in consumption, when the disease is localised to a small area without attendant constitutional symptoms, I have observed the greatest benefit from a winter spent in this district. In bronchial asthma, either with or without emphysema if not of too high a degree, in chronic bronchitis, in persistent winter cough, in the consolidation of pneumonia or pleurisy, the effect of this climate has been said to be good.

Care should be exercised, however, that patients with organic disease of the heart or of the kidneys are not induced to try the more elevated resorts. And those with a tendency to diarrhoea or who suffer much from the fever so often an accompaniment of phthisis, should not venture to try this climate.

GENERAL REMARKS.

The climatic treatment of disease is probably one of the oldest and, perhaps, the least understood of the methods of the healing art, though unquestionably one of the most important.

That disease is able to be modified by a change of climate as well as by a change of residence, was well known long ago, and has been abundantly proved; it is, moreover, true that certain diseases occur only in certain localities, while data exist to show that (in Europe) consumption occurs less frequently at the higher altitudes. The effect of climate on the general health is well illustrated by what occurs at the change of the seasons—*e.g.*, in winter a large increase of bronchial and pulmonary affections is observed, while in the northern countries of Europe the onset of the cold of winter is marked at once by an increase in the death-rate among the old and feeble.

It follows, therefore, that, given a climate which is beneficial to the health, which is free from any great extreme, which increases tissue change while it acts as a tonic to the jaded system, and which is free from any deleterious influences, such is the climate which will render man less likely to fall a prey to the disease influences which may surround him, and which will help him to shake it off soonest should it have attacked him. In this respect South Africa is specially favoured, the mortality tables showing a low death-rate for all diseases, but particularly from pulmonary complaints. "It is on record that while 480 soldiers die yearly out of every 1000 kept in service at Sierra Leone; 121 in the 1000 in Jamaica; 78 in the 1000 in the West Indies generally; 48 in the 1000 in the Madras Presidency; 28 in the 1000 in Bermuda; 27 in the 1000 in the Mauritius; 25 in the 1000 at St. Helena; 21 in the 1000 at Gibraltar; 16 in the 1000 in Malta and Canada; 14 in the 1000 in Nova Scotia and New Brunswick; only 13 in the 1000 die yearly in the Western districts of the Cape Colony, and only 9 in the 1000 in the Eastern district. *In the Campaign in Kafirland in 1835 not a single officer or man was invalided during five months of active service.*" Such a statement, culled from the official records, speaks volumes for the salubrity of the South African climate. It is not to be inferred, however, that no diseases occur here; the prevalent diseases are those of Europe, though of a milder type. There is, however, no ague, or yellow fever, or any of the tropical diseases, nor has cholera or hydrophobia* ever visited our shores.

* Sporadic cases of hydrophobia have been reported, but upon what authority is not clear; it has never, however, been officially notified.

Diseases of the respiratory system are not so frequent and are not attended by so much danger as in Europe. Even infants a few weeks old recover from attacks of acute bronchitis and broncho-pneumonia which would have been invariably fatal in Europe.

Consumption, which in England is said on the authority of the Registrar-General to cause yearly one-eighth of the total deaths, is practically unknown in many of the up-country districts, and generally occurs, only rarely, among the colonists themselves.

An investigation of certain statistics, supplied to me by the Maitland Cemetery Board (Cape Town), would make it appear that the proportion of deaths here from consumption is about the same as that in England, but a large number of these deaths are of invalids who have come here from England with active or latent disease ; it is impossible, therefore, to draw any inference with reference to this point except that, relying upon an experience of some ten years in practice, I can recall only about one dozen cases of pulmonary consumption (tubercular) in South African born subjects (European).

Among the half-breeds and coloured men consumption is said to be more frequent, but yet so infrequent that it may be said to be rare.

While all pulmonary diseases are benefited by a residence here, it cannot be too earnestly recommended that cases sent here should be carefully picked. Invalids are sent frequently—alas! too frequently ; often no doubt they will come, buoyed up by a vain hope—only to die. Cases unsuitable to this climate—printers or clerks, with extensive disease of both lungs, who have to work under the worst conditions to eke out a scanty existence, without means of obtaining either the luxuries or necessities their complaints require.

I say advisedly that a considerable proportion of the cases that arrive here is doomed to disappointment, and that it is wise in every instance to be guided only by the most competent advice before undertaking the journey to South Africa.

Properly to derive any benefit from our climate, an invalid should be fairly robust, with an equable disposition, blessed with abundant resources, and not worried by business or financial cares, and he should make his whole object that of regaining health. I feel assured that, if the same class of invalids who go to the European health resorts were to be sent to South Africa, we would be able to chronicle results far more favourable than those of the most popular resorts.

During what may be called the acute stage of phthisis, when

there is high fever and night sweats, I think the invalid should be best in his own house under proper medical treatment; or, if his condition is not too severe, a residence in the Cape Peninsula preparatory to going up-country may be advised; but when the disease is considerable, affecting the greater part of one lung with breaking down and high fever, indigestion, etc., it would, I think, be unadvisable, until, at all events, the disease is stationary. *Cases of advanced and still active phthisis, in which mostly both lungs are affected, should not be sent.*

Cases of consumption which are suited to the South African climate are those which Dr. Hermann Weber states are best treated by mountain climates:—

1. Disposition to phthisis, whether hereditary or acquired.
2. Catarrh or pneumonic infiltration of the apices.
3. Pneumonic exudation.
4. Chronic bronchial catarrh.
5. Pleuritic exudation.
6. Mucous deposits.
7. Small cavities.
8. Simple laryngeal catarrh.
9. Moderate night sweats and diarrhœa, or slight asthma complicating phthisis, are also frequently benefited.

The contra-indications which the same author mentions are so applicable to the South African climate that I make no apology to take them over:—

1. The erethic constitution, persons who show feverish symptoms on the slightest cause, with irritable heart, constant and frequent pulse, and inability to bear cold or slight changes in temperature.
2. Cases of advanced and still active phthisis.
3. Phthisis complicated by emphysema, or albuminuria or heart disease.
4. Phthisis complicated by ulceration of the larynx.
5. Phthisis with rapid progress and constant fever, and rapidly-increasing loss in weight.
6. Phthisis complicated with empyema.

Hæmoptysis *per se* is not a contra-indication, but frequently recurring hæmorrhage which comes from a large cavity in process of breaking down would need great care.

The invalid who is proceeding up-country should do so by easy stages; the ascent is so gradual that it is likely to be overlooked that the altitude of such a place as Bloemfontein equals that of the Alpine resorts. The greater amount of tissue change and

the increased chest expansion make an increased call on the pulmonary and respiratory systems, and it is wise to allow a sufficient time for the lungs to become accustomed to the altered conditions. A residence at a high altitude in a rarefied atmosphere rich in actinic rays is followed frequently by a sensation of *malaise*, weariness, distaste for sleep and food, with a decrease in weight; and it is only after a short period has elapsed that this is regained. I have found it of benefit, further, to recommend a return to a lower level at the end of some months—to Wagener's Kraal or Beaufort West from Bloemfontein, or to Ceres or Grahamstown, or even to Cape Town or East London, from the Karroo. By such a course I have thought I have observed much benefit in several cases.

The voyage to the Cape has become justly famous as one of the most pleasant and enjoyable it is possible to make, and has earned for itself the title of the "pleasure voyage of the world." After leaving the Bay of Biscay, in a few days smoother waters are reached, and the rest of the voyage is spent under the most enjoyable circumstances. The great ocean steamers of the Cape lines have become celebrated for their comfort and punctuality. Starting from London or from Southampton, they touch, either outward or homeward, at Lisbon, Madeira, St. Helena, and sometimes at Ascension, and following a safe route, without any dangerous obstacles, reach Cape Town in about 18 or 20 days, while some of the fastest boats make the voyage in 15 or 16 days. The steamers all carry a surgeon, and the attendance on board is remarkably good. The larder is provided with the choicest luxuries; fresh meat, butter, milk and eggs, with fruit of every description are abundantly provided.

With all this comfort and luxury these big ships are veritable floating palaces, and nothing can be more enjoyable to the invalid in need of rest and change than three weeks spent upon the ocean under such circumstances. To the sufferer from brain fag, to the convalescent from a severe illness, or to the invalid suffering from phthisis the voyage brings usually better sleep, better digestion, and better health than has been experienced. Unfortunately, in the more advanced cases of consumption, where there is much fever and gastric disorder, the voyage, especially through the tropics, does not produce a similar amount of benefit; the coolest months of the year should therefore be preferably selected to travel through the tropics.

The invalid will be well advised to book to Cape Town, which is the most convenient place to land at, being provided with docks. A stay should be made here for some time, advantage being taken of local experience to select a locality to proceed to. From here.

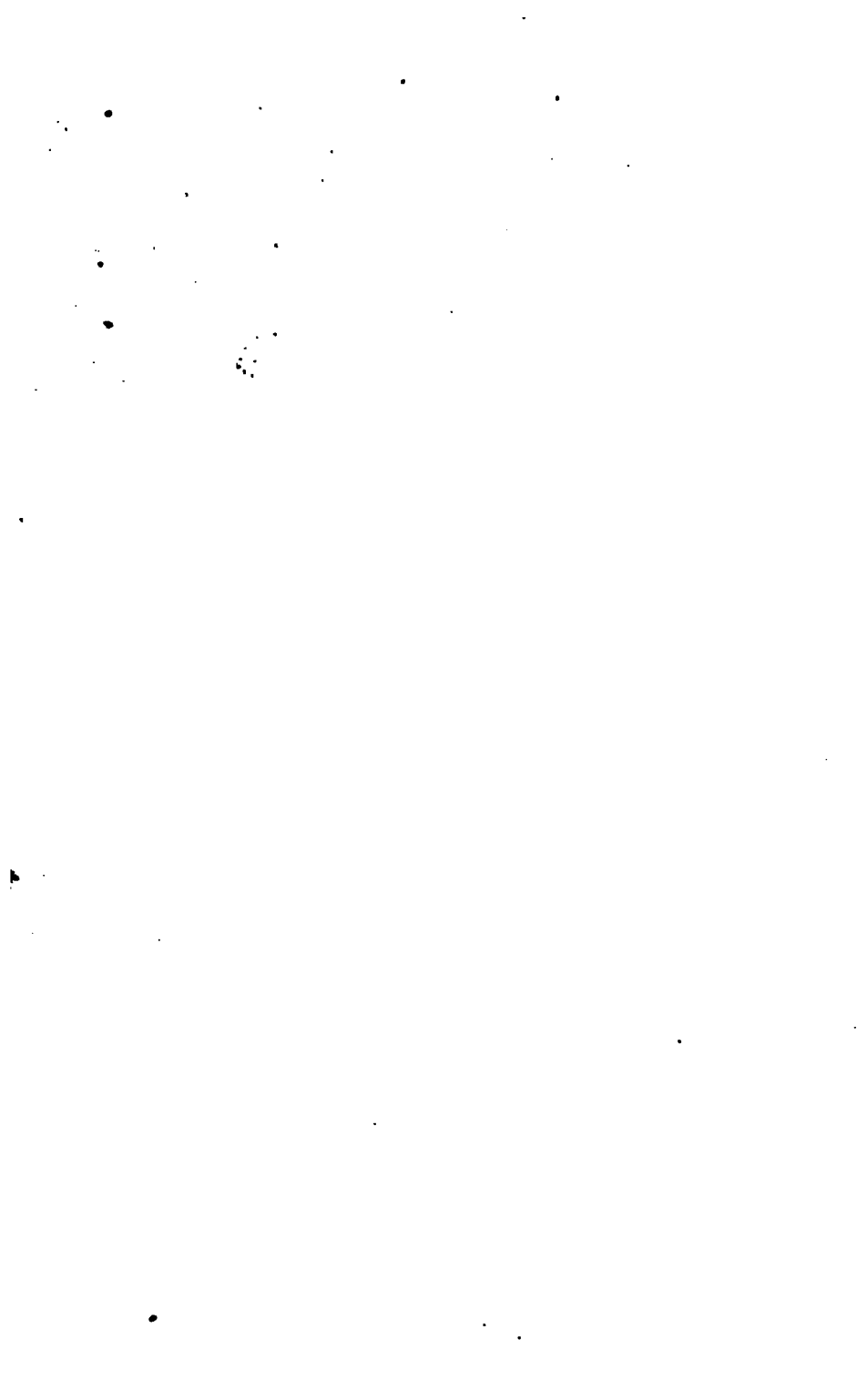
moreover, the main trunk line proceeds up-country to branch off to all parts of South Africa.

The cost of living fluctuates very much, and while in general it may be said to be slightly higher than in England, it is low in the country districts, and rather higher in the towns; luxuries are dear, and servants bad, but the ordinary necessities of life are cheap and plentiful.

With reference to clothing, the same clothing that is worn in Europe will be required here: good, warm, substantial woollen clothes for winter, with a good thick great-coat; while in summer the ordinary light tweeds worn in England, with a waterproof overcoat in case of rain, will be all that is required. There is no need, however, for any cumbersome outfit, as all these things are easily obtainable in all parts of South Africa at slightly over English prices.

STATISTICS OF COLONIES, STATES, AND TERRITORIES OF SOUTH-CENTRAL AFRICA.

	Area in Square Miles.	European or White Population.	Coloured and Native Population.	Total Population.	Revenue.	Expenditure.
Cape of Good Hope	221,311	376,987	1,150,237	1,527,224	£ 4,495,344	£ 4,284,363
Natal	20,461	42,759	512,817	588,576	1,392,455	1,280,965
Pondoland	3,869	100	200,000	200,100	(no return)	(no return)
Zululand	8,900	548	145,336	145,884	51,313	41,200
Amatongaland	5,300	..	80,000	80,000	(no return)	(no return)
Basutoland	10,293	578	218,324	218,892	41,784	40,825
British Bechuanaland	60,777	5,284	55,122	60,376	164,300	164,700
Bechuana British Protectorate	386,200	500	110,000	110,500	(no return)	(no return)
British Mashonaland (south of }	150,000	2,500	250,000	252,500	40,000	36,000
Orange Free State	48,326	77,716	129,787	207,503	310,000	292,700
South African Republic	113,642	160,000	649,560	809,560	1,225,829	1,188,765
Swaziland	8,000	500	63,000	63,500	22,000	22,000
German Protectorate	322,450	1,000	116,000	117,000	(no return)	(no return)
Portuguese Possessions	271,600	400	1,500,000	1,500,400	(no return)	(no return)
British Central Africa and Nyassa-land (north of Zambesi)	600,000	200	2,000,000	2,000,200	(no return)	(no return)



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